Online Pedagogy

The Pedagogical Variation Model
for
asynchronous online teaching

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Certificate of Research

DECLARATION

This dissertation is submitted in partial fulfilment of the requirements for the award of the degree of Doctor of Philosophy of the University of Glamorgan

I declare that this dissertation is the result of my own independent investigation and that all sources are duly acknowledged in the references.

Signed ..... MS Rogers .....

Date ..... 12 April 2013 .....

University of Glamorgan

Dedication

The dissertation is in memory of my head teacher from my school days in Bristol. Nonita Glenday inspired me greatly with her creative thinking and instilled in me a passion for lifelong learning.

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ABSTRACT

The thesis investigates online teaching and learning and in particular, the role of the 'e-moderator' as pedagogical leader in relation to e-learner capabilities. The research builds upon a number of existing models including that of Bass and Alvolio (1996), their 'transactional/task-giving' and 'transformational/motivational' behaviours, and applies these to e-moderator work. Secondly, a review of the research literature provides further concepts applicable to e-learner online behaviour - collaborative capability and knowledge construction ability. These are utilised to create a new model, the 'model of *Pedagogical Variation*', where online teaching is viewed as situational, and e-learners of varying degrees of capability can be given opportunities to maximise their online learning.

A hypothetico-deductive methodology, following the work of Karl Popper (2002), is adopted as the theoretical framework. The research sought to corroborate the proposed pedagogical model, which was successfully achieved with experienced e-moderator practitioners adapting Kelly's (1955) personal construct psychology using the six elements: socialising, scaffolding, knowledge construction, weaving, summarising and archiving. In accordance with the hypothetico-deductive approach, an evaluation was then conducted with the objective of refuting the basic underlying assumptions of the *Pedagogical Variation* model. The model did withstand attempts at falsification, but is presented here as provisional, open to further scrutiny, testing and comparison.

Future research could be in the development of diagnostic tools for e-moderator evaluation of e-learner capabilities and on e-learner preferences regarding the selection of a particular online learning environment. It is suggested that effective online teaching is dependent not only on e-learner context but also on e-moderators' pedagogical leadership. The model for *Pedagogical Variation* is an attempt to show how adaptations in design and delivery can be made in asynchronous learning networks in order to motivate and facilitate successful outcomes for e-learners, whether they are digital natives or digital immigrants (Prensky, 2001). Online course providers and developers may also use the *Pedagogical Variation*

model as a blueprint for exploring creative ways of implementing new emerging learning technologies fit for the 21st Century.

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Glossary

The following is a brief summary of the meanings of terms encountered in the investigation. More information on each of them may be found through a web search, and especially by consulting sites that set out to explain the terms.

Absence of body coined by Stone (1991) describes the invisibility of the physical body in online discussion forums/virtual learning spaces. For some potential e-learners, absence of body may become a disorientating factor, preventing such individuals to participate in online discussion. The non-participation online of these prospective online students is known as *lurking*.

ALN Asynchronous Learning Network: communication through computer networks at any time at irregular intervals for bringing together learning communities (JISC, 2003).

anonymity Anonimity is guaranteed in research when neither the researchers nor the readers of the findings can identify a given response with a given respondent (Babbie, 2004).

archiving The process of filing away sets of discussions for later use or reference that e-learners may wish to re-visit, facilitates storage and retrieval. Archives may also be useful to facilitate comparisons between discussion themes. Frequently, archiving is an effective means in handling postings when they become too numerous. In consideration of an ethical approach to archiving it should be clarified with e-learners where participants will find their contributions, by seeking the permission of the contributors.

ARIADNE Alliance of Remote Instructional Authoring and Distribution Networks for Europe, a body that (among other things) sets standards for e-learning. More information at http://www.ariadne-eu.org.

asynchronous e-learning Refers to learners learning at different times and at irregular intervals from any place (cf **synchronous e-learning**) (Garrison and Anderson, 2003)

authoring tool A software application that enables the non-techie to create e-learning content relatively easily (Fee, 2009).

avatar A virtual tutor, or animated character, who guides learners through a course of e-learning (and has wider applications on other websites) (Garrison and Anderson, 2003)

Behaviourism as a theory was primarily developed by *B. F. Skinner*. It loosely encompasses the work of people like Edward Thorndike, Tolman, Guthrie, and Hull. What characterizes these investigators are their underlying assumptions about the process of learning. In essence, *three basic assumptions* are held to be true. First, learning is manifested by a change in behaviour. Second, the environment shapes behaviour. And third, the principles of contiguity (how close in time two events must be for a bond to be formed) and reinforcement (any means of increasing the likelihood that an event will be repeated) are central to explaining the learning process. For behaviourism, learning is the acquisition of new behaviour through conditioning (Conole, 2008).

bias the quality of a measurement device that tends to result in a misrepresentation of what is being measured (Babbie,2004).

Blended learning (BL) A mixture of traditional face to face lectures with online learning modules integrated into students' programmes of study. BL was developed by a team of academics and software designers from the Centre of Excellence in Learning and Teaching (CELT) at the University of Glamorgan and introduced across several

University Faculties and Partnership Colleges (Chew, Jones and Turner, 2007; Mistry, 2008)

bipolar construct as used in personal construct psychology (Kelly, 1955)

Boston matrix It was developed in 1970 by the Boston Consulting Group. A chart with four quadrants that was originally used to help businesses analyse themselves by placing themselves (or their subsidiaries or products) into one of the four quadrants. The chart plots market share (on the x-axis) against growth rate (on the y-axis). In the Research investigation (Rogers, 2011), the 2 x 2 matrix used to develop three hypothetical models for *Pedagogical Variation.* In Model 1, the chart plots e-moderator transactional task-giving behaviour (on the x-axis) against e-moderator transformational, motivational support behaviour (on the y-axis).Both axes vary from 'low' at the origin to 'high'. In Model 2, The chart plots e-learner collaborative capability (on the x-axis) against e-learner knowledge construction ability (on the y-axis).In this model both axes vary from 'high' at the origin to 'low'. When these two 2 x 2 matrices are merged, Model 3 for *Pedagogical Variation* is created.

CBT Computer-based training, an old name for e-learning from before the advent of the internet, dating from when courses were stored on individual or networked computers or disks (Moule,2007)

CD ROM Stands for 'compact disk read-only memory'. A storage device of smaller capacity than a DVD, originally designed to store music, but can hold any kind of data; a typical CD ROM, often now abbreviated to just CD, can hold around 700 megabytes of data (Moule, 2007)

chat room or **chatroom**. A faster-paced version of a discussion forum.(As in a discussion forum, the 'chat' is typed and read, rather than spoken and heard.). Latterly eclipsed by developments in discussion forums and instant messaging, but sometimes loosely used as a collective term for all online discussion applications (Palloff and Pratt, 1999).

coding The process whereby raw data are transformed into standardised formats for analysis e.g. the process of using coding templates for content analysis (Babbie,2004).

collaborative learning (CL) is a personal philosophy, not just a classroom technique. In all situations where people come together in groups, it suggests a way of dealing with people which respects and highlights individual group members' abilities and contributions. There is a sharing of authority and acceptance of responsibility among group members for the group's actions. The underlying premise of collaborative learning is based upon consensus building through cooperation by group members, in contrast to competition in which individuals try to outperform other group members.(Thorpe, 2009)

community of practice A group of people with shared interests and experience cooperating over an extended period of time to learn together, often by means of e-learning (Wenger, 1998).

competency-based teaching and learning Acquiring skills to perform specific activities; being able to measure up to particular criteria of achievement. E.g. in online teaching and learning and pedagogical leadership competencies online.

computer conferencing organising a conference between two or more participants at different sites. Computer networks are used to transmit any combination of text, audio/video formats (Palloff and Pratt, 1999).

computer-mediated conferencing (CMC) is defined as any communicative transaction that occurs through the use of two or more networked computers. Thurlow, Lengel, and Tomic (2004). While the term has traditionally referred to those communications that

occur via computer-mediated formats (e.g., instant messaging, email, chat rooms), it has also been applied to other forms of text-based interaction such as text messaging. Research on CMC focuses largely on the social effects of different computer-supported communication technologies. Many recent studies involve Internet-based social networking supported by social software.

CMC computer-mediated-communication participants use computer networks to communicate with each other, usually asynchronously (Mason, 1991).

computer-supported collaborative learning (CSCL) is concerned with meaning and the practices of meaning-making in the context of joint activity, and with the ways in which these practices are mediated through instructional design. The concern for a process-oriented account of collaboration underlies most research on Computer-Supported Collaborative Learning (CSCL) during the last decade (Stahl, 2002; Engeström et al., 2002), from individuals to dyads, to finally larger social contexts in which groups interact with other groups to produce learning and create knowledge. The process and practices of meaning-making focuses on the social practices of joint meaning-making, rather than individuals' practices in social settings. Stahl (2002) argues that an adequate theoretical foundation for CSCL must explain how individual practices are social without forgetting that the social is grounded in individual activities; concepts of praxis, activity, social reproduction, structuration and enactment.

conceptualization The mental process whereby fuzzy and imprecise notions (concepts) are made more specific and precise (Babbie,2004).

confidentiality A researcher guarantees confidentiality when s/he can identify a given person's responses but promises not to do so publicly (Babbie,2004).

conflict paradigm where conflicting theories are discussed and new ideas develop (Babbie, 2004). In the research investigating online pedagogy conflict arises between instructivists on the one hand and constructivists on the other.

constructivism views learning as a process in which the learner actively constructs or builds new ideas or concepts based upon current and past knowledge or experience. In other words, "learning involves constructing one's own knowledge from one's own experiences." *Piaget* (1951) the founder of Constructivism-argues that humans generate knowledge and meaning from an interaction between their experiences and their ideas. Constructivist learning, therefore, is a very personal endeavour, whereby internalized concepts, rules, and general principles may consequently be applied in a practical real-world context. This is also known as *social constructivism.* Constructivism itself has many variations, such as Active learning, discovery learning, and knowledge building. Regardless of the variety, constructivism promotes a student's free exploration within a given framework or structure. The teacher acts as a *facilitator* who encourages students to discover principles for themselves and to construct knowledge by working to solve realistic problems (Salmon, 2000). Aspects of constructivism can be found in self-directed learning (Grow, 1991; Garcia and Pintrich, 1994), transformational learning, experiential learning, situated cognition (Kincheloe, 2005), and reflective practice (Schön, 1987).

construct validity The degree to which a measure relates to other variables as expected within a system of theoretical relationships (Babbie,2004).

content validity The degree to which a measure covers the range of meanings included within a construct(Babbie,2004).

cooperative learning The underlying premise for *cooperative learning* is founded in constructivist theory. Knowledge is discovered by students and transformed into concepts students can relate to. It is then reconstructed and expanded through new

learning experiences. Learning consists of active participation by the student versus passive acceptance of information presented by an expert lecturer. Learning comes about through transactions and dialogue among students and between faculty and students, in a social setting. Students learn to understand and appreciate different perspectives through a dialogue with their peers. A dialogue with the teacher helps students learn the vocabulary and social structures which govern the groups students wish to join, such as historian, mathematician, writer, actor (Garrison and Anderson, 2003)

corroborate - to add proof to an *account, statement, idea,* with new information Cambridge Dictionary Online (June 2011)

corroborability According to Popper (2002), the falsifiability of a hypothesis represents a necessary precondition for its corroborability

courseware Usually refers to the components of a course, such as text, images, animations, audio and video clips; can also be used as a collective term to refer to online courses and other learning opportunities (Palloff and Pratt, 1999)

Dependent variable a variable assumed to depend on or caused by another (called the *independent variable*).

Department for Education and Skills (DfES), Launched "*The future of higher education*", London: HMSO (2003) and "*The e-strategy- harnessing technology: transforming learning and children's services*", London: HMSO (2005).

digital natives These are Students of today, who represent the first generations to grow up with the new technology. They have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age. As a result of this ubiquitous environment and the sheer volume of their interaction with it, today's students *think and process information fundamentally differently* from their predecessors. These differences go far further and deeper than most educators suspect or realize. Some refer to them as the N-[for Net]-gen or D-[for digital]-gen. But the most useful designation for them is *Digital Natives.* Our students today are all "native speakers" of the digital language of computers, video games and the Internet (Prensky, 2001).

discussion forum Also known as a **bulletin board**. A place where multiple users can post comments by typing them into a set framework; a means for learners to contribute to discussions (Berge, 1995)

E- A prefix standing for 'electronic', generally used to denote the computer- or internet-based version of any activity, such as e-learning, e-tivities (Salmon, 2000)

e-assessment The provision of tests (and other forms of assessment) online, including automated scoring (Fee, 2009).

element as found in the concept of *personal construct psychology* (Kelly, 1955)

e-portfolio A means of collecting and maintaining evidence for assessment, online (Fee, 2009).

experimental group In experimentation, a group of subjects to whom an experimental stimulus has been administered (Babbie,2004). E.g. a particular style of online teaching (stimulus) that has been provided in trial sample to elicit the effect the stimulus on the learning outcomes (if any) of the subjects. The *control group* would be one which is

similar in all respects to the experimental group with the exception where the stimulus was absent.

Falsifiability or **refutability** is the logical possibility that an assertion could be shown to be false by a particular observation or physical experiment. That something is "falsifiable" does not mean it is false; rather, it means that *if* the statement were false, then its falsehood could be demonstrated (Popper 2002). A falsifiable theory that has withstood severe scientific testing is said to be corroborated by past experience, though in Popper's view this is not equivalent with confirmation and does not guarantee that the theory is true or even partially true.

flaming using unpleasant, derogatory language, scornful, racial innuendo, mocking and extreme anger; classified as unacceptable by e-moderator standards of personal respect for others (Garrison and Anderson, 2003).

formative assessment Assessment 'as you go', designed to help the learner gauge his or her progress (cf **summative assessment**) (Mortimer, 1999)

Hypothesis (from Greek *ὑπόθεσις*; plural **hypotheses**) is a proposed explanation for a phenomenon. The term derives from the Greek, *ὑποτιθέναι – hypotithenai* meaning "to put under" or "to suppose". For a hypothesis to be put forward as a **scientific hypothesis**, the scientific method requires that one can test it. Scientists generally base scientific hypotheses on previous observations that cannot satisfactorily be explained with the available scientific theories. Even though the words "hypothesis" and "theory" are often used synonymously in common and informal usage, a scientific *hypothesis* is not the same as a scientific *theory*. A working hypothesis is a provisionally accepted hypothesis (Babbie, 2004)

Any useful hypothesis will enable predictions by reasoning (including deductive reasoning) (Dooley, 1984).

hypothesis testing research instrument An online questionnaire used in the research investigation in an attempt to falsify the Hypothetical Frameworks for *Pedagogical Variation* conceptualised in the research.

hypothetico-deductive methodology A scientific method whereby science should set up testable hypotheses and then try to falsify them rather than trying to confirm them directly by accumulation of favourable evidence. Introduced by English scholar, William Whewell (1794-1866) and developed especially by Austrian philosopher, Karl Popper (1902-1994)

Those hypotheses which, despite severe tests, survive unfalsified are thereby confirmed for Whewell. Popper goes further and says they are merely corroborated, a notion which is supposed to avoid the logical invalidity associated with induction (Willig, 2001)

Ideographic An approach in explanation in which we seek to exhaust the idiosyncratic causes of a particular condition or event(Babbie,2004).

IEEE Institute of Electrical and Electronics Engineers, a body that (among other things) sets standards for e-learning. More information at http://ltsc.ieee.org. (Fee, 2009).

IMS Or IMS Global Learning Consortium: Instructional Management System, a body that (among other things) sets standards for e-learning. More information at http://imsproject.org. (Fee, 2009).

independent variable A variable with values that are not problematic to an analysis but are taken as simply given. An independent variable is presumed to cause or determine a dependent variable (Babbie,2004).

induction The classic philosophical treatment of the problem of induction was given by the Scottish philosopher David Hume. Hume highlighted the fact that our everyday functioning depends on drawing uncertain conclusions from our relatively limited experiences rather than on deductively valid arguments. *Inductive reasoning*, also known as *induction* or *inductive logic*, is a kind of reasoning that constructs or evaluates inductive arguments. It is commonly construed as a form of reasoning that makes generalizations based on individual instances. In this sense it is often contrasted with deductive reasoning (Babbie, 2004).

Rather, the premises of an inductive logical argument indicate some degree of support (inductive probability) for the conclusion but do not entail it; that is, they suggest truth but do not ensure it (Dooley, 1984).

A research methodology where theory comes out of empirical research studies as contrasted to deduction where theory precedes empirical research. i.e. theory *before* research is equivalent to *Deduction* and theory *after* research is equivalent to *Induction*

informed consent A norm in which subjects base their voluntary participation in research studies on a full understanding of the possible risks involved and that they may withdraw at any time during their involvement(Babbie,2004).

instructivist approach is based on behaviourist theories, sometimes called direct instruction or objectivism. This approach involves a teacher-directed and carefully planned curriculum, with purposeful teaching at its core. It follows two basic assumptions. First, the purpose of instruction is to help the learner understand and interact with the world; and secondly learner should be directed by instructors, who make the decisions about the content and sequence of the learning. The instructors would base these decisions on professional training and scholarship (Harris et al., 1995).

The instructivist, or behaviourist, approach, is to pre-plan a curriculum by breaking down a subject area (usually seen as a finite body of knowledge) into assumed component parts, and then sequencing these parts into a hierarchy ranging from simple to more complex (Conole, 2008)

The major criticism of this approach is that learners have few opportunities to develop critical and reflective skills (Schön, 1987). In this approach, teachers know what their students should learn and how they are expected to behave. Students are rewarded for success, as in behaviourism, and failure is not tolerated. The object is to focus on the content itself, not the learner or learning experience.

interview A data-collection encounter in which one person (the interviewer) asks questions of another (the respondent) (Babbie,2004).

Joint Information Systems Committee (JISC) launched the e-learning Programme and the *Framework for Pedagogical Evaluation of VLEs* (JISC, 2003).

Knowledge Construction-Constructive Processes. Learning involves constructing one's own understanding/meaning of one's personal inner world and outer worldview. New knowledge is constructed with prior knowledge (from experience, cultural, social and environmental aspects).

knowledge management A concept closely related to e-learning, used to refer to the sharing and development, by people and organizations, of things they know. Some technologies support both knowledge management and e-learning (Garrison and Anderson, 2003).

Learner centred teaching means subjecting every teaching activity (method, assignment or assessment) to the test of a single question: *"Given the context of my*

students, course and classroom, will this teaching action optimizes my students' opportunity to learn?"

Optimizing learning opportunities for 200 students is likely to be different than for 20, so the context of the course plays a significant role in the actions a teacher can take. Selecting the word opportunity, here, is important because that is all any teacher can provide for their students (Thorpe, 2009). Great teachers maximize the opportunities for students to learn, but even the greatest teachers cannot guarantee learning. The final outcome of what gets learned in any course will always be the students' responsibility. Learner-cantered, instructional practice needs to change in five key areas: the balance of power, the function of content, the role of the teacher, the responsibility for learning, and the purpose and processes of evaluation (Mortimer, 1999).

learner management system (LMS) A platform for managing information about learners, stored in a relational database, and generating management reports. Part of a **virtual learning environment** (Fee, 2009).

learning content management system (LCMS) A platform for managing learning content, such as online courses, usually in the form of learning objects. Part of a *virtual learning environment* (Fee, 2009).

learning platform 'Platform' is ICT jargon for a framework that allows software to run; in a learning context, this means the enabling technology for the e-learning – see **virtual learning environment** (Fee, 2009).

Likert scale A type of composite measure developed by Renesis Likert (1932) in an attempt to improve the levels of measurement in social research through the use of standardised response categories in survey questionnaires to determine the relative intensity of different items. Likert items are those using such responses as strongly agree, agree, disagree, and strongly disagree. (don't know can also be included) (Babbie,2004).

localization The adaptation of e-learning produced in one nation or culture to other nations or cultures; may include language translation, currency conversion, style changes, different reference material (Fee, 2009).

lurking in essence is non-participation in online learning activities.(Gulati, 2004) Lurkers are known to look up what's going on in the online discussion forum as the software infrastructure of the learning platform monitors instances of online entry. Amongst reasons given in the research for lurking are discomforts of becoming visible as a member of the interacting membership of a learning community, inability to put their opinions out under the scrutiny of the public eye and a disorientating sense of absence of body (Stone, 1991)

Managed learning environment Or managed learning system. An alternative name for a *virtual learning environment* (Fee, 2009).

motivational support The definition of motivation is to give reason, incentive, enthusiasm, or interest that causes a specific action or certain behaviour. (Avolio and Bass, 2002). A pedagogical transformational leader that implements motivational techniques will see an increased participation, effort, and higher-order learning. Part of an e-moderator's job is to provide an environment that is motivationally charged. This environment accounts for online learners who lack their own internal motivation.

multifactor Leadership Questionnaire (MLQ—also known as MLQ 5X short or the standard MLQ) measures a broad range of leadership types from passive leaders, to leaders who give contingent rewards to followers, to leaders who transform their followers into becoming leaders themselves. The MLQ identifies the characteristics of a transformational leader and helps individuals discover how they measure up in their

own eyes and in the eyes of those with whom they work. The program described in the MLQ Trainer's Guide provides a solid base for leadership training (Bernard M. Bass & Bruce J. Avolio, 2002).

Netiquette an abbreviation for *Internet etiquette*. Guidelines for online polite exchanges to avoid flaming in online interactions and also discouraging certain electronic formats (e.g. special formatting of text which may be invisible to some online users) (Palloff and Pratt, 1999).

nomothetic An approach to explanation in which we seek to identify a few causal factors, that generally impact a class of conditions or events

Open-ended questions Questions for which the respondent is asked to provide his/her own answers (Babbie, 2004).

operational definition The concrete and specific definition of something in terms of the operations by which observations are to be categorised.

operationalisation One step beyond conceptualisation Operationalisation is the process of developing operational definitions, or specifying the exact operations involved in measuring a variable (Babbie, 2004).

Paradigm A model or framework for observation and understanding, which shapes both what we see and how we understand it.

paradigms shift The revolution in assumptions about and perceptions of a research problem during which one paradigm is replaced by another (Dooley, 1984).

paradox An apparent contradiction between theories, observations or both (Dooley, 1984). A paradox exists between theory of instructivism and theory of constructivism.

pedagogy (pronounced /ˈpɛdəgɒdʒi/ or (peor /ˈpɛdəgoʊdʒi/) is the study of being a teacher or the process of teaching. The term generally refers to strategies of instruction, or a style of instruction. The word comes from the Greek παιδαγωγέω (paidagōgeō); in which παῖς (*pais*, genitive παιδός, *paidos*) means "child" and ἄγω (*ágō*) means "lead"; so it literally means "to lead the child". In Ancient Greece, παιδαγωγός was (usually) a slave who supervised the instruction of his master's son (girls were not publicly taught). This involved taking him to school (διδασκαλεῖον) or a gym (γυμναστήριον), looking after him and carrying his equipment (e.g. music instruments). The Latin-derived word for pedagogy: child-instruction is in modern use in English to refer to the whole context of instruction, learning, and the actual operation involved therein, although both words have roughly the same original meaning. In English the term pedagogy is used to refer to instructive theory; trainee teachers learn their subject and also the pedagogy appropriate for teaching that subject. The introduction of information technology into schools has necessitated changes in pedagogy; teachers are adopting new methods of teaching facilitated by the new technology. The late Malcolm Knowles reasoned that the term *andragogy* is more pertinent when discussing adult learning and teaching. He referred to andragogy as the art and science of teaching adults (Mortimer, 1999).

pedagogical leadership There are four main aspects to pedagogical leadership. First, to lead involves influencing others in mutual benefit. Second, where there are online pedagogical leaders there are online followers. Third, online pedagogical leaders seem to grasp the nettle when there is a crisis or special problem in online learning communities. In other words, they often become visible when an innovative response is needed. Fourth, pedagogical leaders are people who have a clear idea of what they want to achieve and why in a particular learning environment. Thus, pedagogical leaders are people who are able to think and act creatively in non-

routine situations, and who set out to influence the actions, beliefs and feelings of their online learners.

Pedagogical Variation A term coined in the research (Rogers, 2011) which describes the situational relationship between e-moderating and e-learning. An e-moderator's pedagogical leadership online with respect to task-giving and motivational support varies according to e-learner online collaborative capability and knowledge construction ability. In the dynamic model a reciprocal relationship exists where e-learner online behaviours vary according to e-moderator online behaviours.

personal construct psychology The founder George Kelly (1955) recognised that every person thinks about his/her inner worldview and outer worldview by construing events. Individuals seek to anticipate real events and through this anticipation, a future reality is better represented. "*It is the future that tantalizes a man, not the past. Always he reaches out to the future through the window of the present*" (Kelly, 1955/1991, p.49/ Vol.I, p.34.). It may be said that once an event is construed, it becomes part of the construing system and so has become an aspect of some of the constructs that have been used to construe it. The method of eliciting constructs, which are bi-polar, uses so-called 'elements'. This is discussed in the Empirical Study 1 of the research investigation (Rogers, 2011).

plausible rival hypotheses Believable or possible alternative explanation of an observation (Dooley, 1984).

principal component analysis (PCA) a mathematical procedure using eigenvalues decomposition of a data covariance matrix. Variables which are correlated are grouped into uncorrelated groups which are known as Principal Components. There are fewer Principal Components than original variables. In this transformation the first principal component has as high a variance as possible and each succeeding component, in turn, has the highest variance as possible within the constraints of the transformation (Keeves, 1997).

platform A generic term for a software framework, including system architecture, operating systems and programming languages; in e-learning, a platform usually means a **virtual learning environment** (Fee, 2009).

Questionnaire A document containing questions and other types of items to solicit information appropriate for analysis. An online questionnaire was used in this investigation as a *Hypothesis Testing Research Instrument.*

Reliability The quality of measurement method that suggests that the same data would have been collected each time in repeated observations of the same phenomenon (Babbie, 2004).

replication Repeating a research study t5o test and either confirm or question the findings of an earlier study(Babbie, 2004).

representativeness The quality of a sample having the same distribution of characteristics as the population from which it was selected (Babbie, 2004).

response rate The number of people participating in a survey divided by thc number selected in the sample, in the form of a percentage. This is also known as the *completion rate,* or in self-administered surveys, the *return rate* (the percentage of questionnaires sent out that are returned) (Babbie, 2004).

Scaffolding is a form of assistance provided to a learner by a more capable teacher or peer that helps the learners perform a task that would normally not be possible to accomplish by working independently. Integrated into pedagogical practice,

scaffolding is intended to motivate the learner, reduce task complexity, provide structure and reduce learner frustration. Scaffolding can be provided both electronically and by an online tutor. The most important point about scaffolding is that it engages the learner actively at his/her current level of understanding until the point where the support is no longer required (McLoughlin and Marshall, 2000). Scaffolding is also a way of gradually moving from what we might call directed instruction to a constructivist approach from short-term needs to the longer term and from immediate to more holistic learning. (Salmon, 2011:33)
Scaffolding means gradually building on participants' previous experience. A structured learning scaffold offers essential support and development to participants at each stage, as they build up their expertise in learning online.

shirking describes the avoidance of prospective online learners to work online whether as visible participants or lurkers, who at least do look to see what is happening in a discussion forum which they have enrolled on, even though they may not actively participate online. Shirkers may also be viewed as irresponsible in avoiding or neglecting their obligation to study when accepted through enrolment on an online course of study.

snowball sampling A nonprobability sampling method often employed in field research whereby each person interviewed may be asked to suggest additional people for interviewing (Babbie, 2004).This sampling method was used in both Empirical Study 1 and Empirical Study 2 of the research investigation..

social constructivists posit that knowledge is constructed when individuals engage socially in talk and activity about shared problems or tasks. Learning is seen as the process by which individuals are introduced to a culture by more skilled members (Dewey, 1933; Vygotsky, 1978)

summative assessment The assessment that 'sums up' a piece of learning by giving a final test of what the learner has learned. Usually deployed as a judgement of a learner's attainment, such as for a qualification (Fee, 2009).

summarising

The main purpose of summarizing is to signal the closure of an e-tivity, reminding participants of the journey they have travelled. A summary may provide a footprint as a spark for a new e-tivity. At the same time, the summary may also reinforce and imprint new information and knowledge.

synchronous e-learning 'Synchronized' learner participation; that is, learners learn at the same time (c.f. **asynchronous e-learning**) (Fee, 2009).

Task-giving conscientiousness in paying proper attention to a task; as in transactional leadership (Avolio and Bass, 2002)

teacher tells, a *facilitator* **a**sks; a teacher lectures from the front, a *facilitator* supports from the back; a teacher gives answers according to a set curriculum, a *facilitator* provides guidelines and creates the environment for the learner to arrive at his or her own conclusions; a teacher mostly gives a monologue, a *facilitator* is in continuous dialogue with the learners (Salmon,2000;Laurillard,2002). A facilitator should also be able to adapt the learning experience 'in mid-air' by taking the initiative to steer the learning experience to where the learners want to create value.

teacher-centred approach is one where activity in the class is centred on the teacher. It can be compared to a learner-centred approach.

testability, a property applying to an empirical hypothesis, involves two components: (1) the logical property that is variously described as contingency, defeasibility, or

falsifiability, which means that counterexamples to the hypothesis are logically possible, and (2) the practical feasibility of observing a reproducible series of such counter examples if they do exist. In short, a hypothesis is testable if there is some real hope of deciding whether it is true or false of real experience. Upon this property of its constituent hypotheses rests the ability to decide whether a theory can be supported or falsified by the data of actual experience. If hypotheses are tested, initial results may also be labelled inconclusive (Popper, 2002).

theory A systematic explanation for the observations that relate to a particular aspect of life (Babbie, 2004).

transformational leadership is defined as a leadership approach that is empowering causing change in individuals and social systems. In its ideal form, it creates valuable and positive change in the followers with the end goal of developing followers into leaders. Enacted in its authentic form, transformational leadership enhances the motivation, morale and performance of followers through a variety of mechanisms. These include connecting the follower's sense of identity and self to the mission and the collective identity of the organization; being a role model for followers that inspires them; challenging followers to take greater ownership for their work, and understanding the strengths and weaknesses of followers (Avolio and Bass, 2002).

transactional leadership in contrast have the end goal of achieving a pre-defined goal/task rather than developing followers into leaders. Transactional leadership is based much more on the notion of hierarchy and position. (Avolio and Bass, 2002).

Validity Term describing a measure that accurately reflects the concept it is intended to measure. The Hypothesis Testing Research Instrument was designed to determine the degree of falsification of the Hypothetical Framework for *Pedagogical Variation.*

virtual classroom A term coined by Hiltz (1994); a means of holding live or 'synchronous' learning events/ synchronous online; part of a *virtual learning* Examples

Weaving

Feenberg (1989) coined the term 'weaving' to describe the flow of discussion and how it can be pulled together. It is a means whereby e-learners may recognise that their inputs become a meaningful contribution as their e-moderator collects their statements from their online postings, relating them to concepts and theories relevant in their course.

PART ONE

Theoretical Background and Research Rationale

Chapter One: Introduction to the thesis

1.0 Professional practice in online teaching and learning

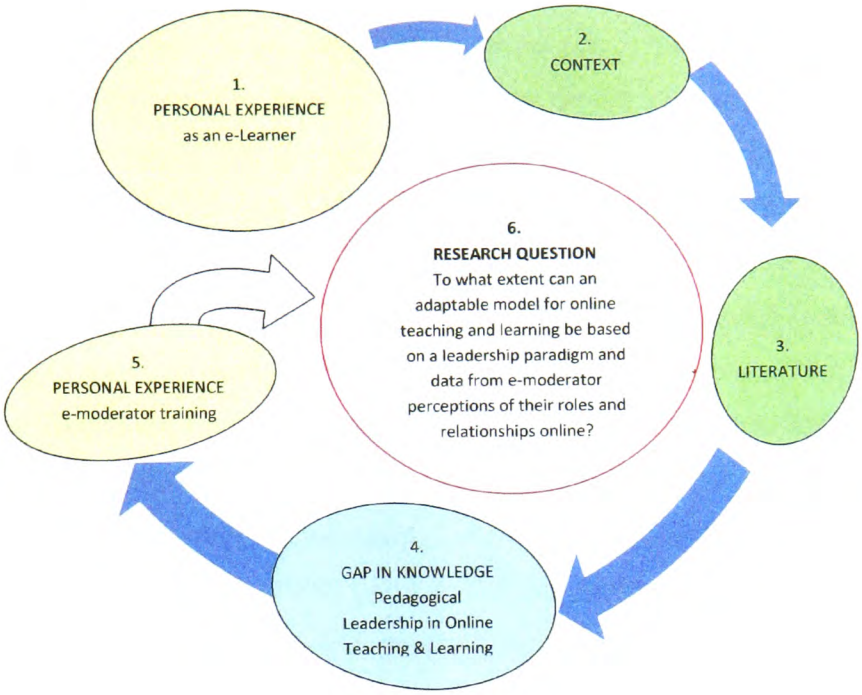
This chapter gives an overview of the research investigation including theoretical influences, experiential commentary and methodological contexts. The study took place over a period of six years (Autumn 2004-2010) at The University of Glamorgan (UoG), Pontypridd, UK.

The difficulties some fellow students on a Masters' degree in Professional Development (MAPD) were experiencing in engaging interactively with each other and with an online tutor, using written messages in an online discussion forum, were observed and noted. Unlike in a traditional face-to-face classroom, where conversations are spontaneous and synchronous (i.e. based in real-time), the online discussion forum depended on text postings that could be made at any time (i.e. asynchronously). On the MAPD, the learners were experienced teachers, but novices in the online context. In relation to each other, they were 'peers' in an e-learning network/group/environment. The term 'online' in the thesis will be used to denote the processes of delivering, supporting and evaluating teaching and learning through the use of computers and communication networks. The researcher was motivated to explore further, because online learning has the potential not only for sharing and developing knowledge, but also for creating learning and teaching networks in diverse global classrooms. There are also key professional and pedagogical implications for teachers as leaders and facilitators of learning and education arising from this.

1.1 The Purpose of the Research

The purpose of the research is to develop a model for online teaching, based on a leadership paradigm and data collected from e-moderator practitioners. The application here is not in synchronous online learning environments - which Hiltz (1994:7) coined as *Virtual Classrooms* (VC) - but in asynchronous learning networks (ALNs). In the sections that follow below, the researcher's experience as a novice e-learner is framed analytically and situationally. Following this, an outline of both the research background and the relevant literature on current practice and theory is presented. Arguments relating to a gap identified in this area of knowledge are then discussed. The way in which these initial insights led to the creation of the research question is illustrated in Figure 1.1 below

Figure 1.1 Process of arriving at the Research Question



1.2 The Experiences of a Novice in an E-Learning Environment

I start from my experiences of e-learning as a traditional classroom teacher who recognised that online teaching was fast becoming a way of sharing and developing knowledge through the creation of learning and teaching networks on a global scale in both Higher Education (HE) and Further Education (FE). For this reason, the researcher enrolled in an E-College Wales (ECW) pilot online programme (MAPD, 2001-July 2004). In this online learning environment e-learners felt that they were in a safe environment. There had been a lot of talk and concern about unauthorised access, hacking and lack of trust in the confidential nature of sharing ideas with strangers or intruders in social networks (Benfield, 2002).

It was a strange experience, after logging on for the first time, to enter the online classroom as a novice e-learner without physical face-to-face presence because of the uncertainty of how to recognise the online tutor and how to recognise e-peers. But that uncertainty was soon overcome by an initial welcome message from the online tutor. Hiltz, Zhang and Turoff (2002:22) emphasise that, "*the role of the instructor and his or her ability to deal with this new mode of learning is a principal factor in asynchronous learning network (ALN) success*".

1.2.1 The invisible 'other'

The invisibility of students and teachers online affects both teachers and students. Stone (1991:185) makes us aware of how "*absence of body*" prevents people getting non-verbal cues from each other - from hand gestures and facial expressions as well as eye-contact. All these non-verbal cues are integral to our physical presence in face-to-face communication. It might be argued that visible personal appearance of e-peers giving clues such as age, gender and ethnic origin, are also missing in a person's physical absence. An ALN has a distinct character where e-learners are generally physically separate from and largely 'invisible' to one another and their e-tutor "*without a visible body*" (Stone, 1991:185). It is through interactive text-based communication that online learners are not only able to recognise each other's presence but are also able to respond to each other's messages (Palloff and Pratt, 1999; Anderson 2003).

In the familiar face-to-face classroom, there are significant factors that encourage students to participate in the learning process, including non-verbal cues. This human interaction (Moore, 1989; Jonassen, 1995; Wozniak, 2007) plays a vital part in the sharing and exchange of thoughts and ideas. In comparison to the physical presence for learners in a traditional classroom setting, Stone (1991:184) describes the phenomenon of the participant in online discussion forums as a virtual e-self. She suggests that the enigma of "*absence of body*" may become a dis-orientating factor, from which experience there may emerge a so-called 'e-self'. In our culture, the face-to-face encounter via the physical body, she argues, is held as the ideal paradigm for the meeting of ideas. In other words, communication seems most complete and successful where a person is physically present 'in' the written message (Stone, 1991:186).

1.2.2 Belonging to an online Learning Community: Levels of Interactivity

Acquiring knowledge through reflection is a way of learning from practice (Dewey, 1938) and it was through personal critical reflection-on-action (Schön, 1992) with hindsight, during the online asynchronous discussions that the researcher came to understand the importance of belonging to an online Learning Community of Practice (Wenger, 2000; Sorensen, 2004). The energy required to sustain online collaboration in a Learning Community comes from e-peers and the online tutor (Wozniak, 2007). Sorensen (2004:243) asserts that "the inability to stimulate online interaction may be traced to a lack of understanding among designers and instructors of the characteristics of dialogue in virtual environments." By a similar argument, Wozniak (2007:209) states that "effective interaction requires not only the careful design of e-learning activities, but more importantly, the empowerment of the learner to engage collaboratively with others." As a member of an online Learning Community, I found that there were ample opportunities for sharing personal experiences and expertise by focusing on a

common goal (Conrad, 2007). I soon realised, as a participant observer, that interaction is a key factor to supporting online engagement in learning (Moore, 1989; Anderson, 2003; Lear, Ansorge and Steckelberg, 2010).

An initial introduction to Moore's three typologies (i.e. learner-learner, learner-teacher and learner-content) is useful here.. Firstly the learner-learner interaction is to be encouraged in the building of an online Learning Community. Morrison (2007:108) argues that in contrast to surface or shallow learning, offered by a traditional transmission teaching approach (e.g. emphasising the memorizing and recall of facts), deep learning, dependent on holistic thinking (i.e. critical and creative thinking) arises from learner-learner interactions through the sharing of ideas, experiences and meaningful knowledge creation within a social context. Secondly learner-teacher interaction is seen to be important, whereby the learner interacts with an expert of the subject matter (Garrison and Anderson, 2003) to gain motivational support, self-direction, advice on presentation of work, with e-moderator feedback and evaluation (Berge 1995). A third dimension of interaction is seen as learner-content. In the learner-content interaction, the learner is interacting with the content in such a way that "the content changes in the learner's understanding, the learner's perspective, or the cognitive structures of the learner's mind" (Moore 1989:2). According to Holmberg (1986) the learner-content interaction is viewed as the "*internal didactic intervention*" when learners become so close to the learning material that they begin to "*talk to themselves*". For asynchronous text-based online learning this kind of intervention is significant in individual meaning-making which can be shared with others. These three aspects of interaction in an online Learning Community were experienced also in the e-moderator training module which is discussed later in this introductory chapter.

1.2.3 Reflections on the New E-learning Experience

Practice-based knowledge, what Schön (1992) calls reflection-on-action, helped the researcher to learn more about the way e-learning was being used in HE courses. The development of the learning materials was achieved by a team of academics and instructional designers at the University (Jones and O'Shea, 2004). These materials were then delivered to participants through a virtual learning environment (VLE) supported by the commercially based Blackboard platform. Blackboard provided the facilities of notice boards for e-learner and e-moderator postings. E-moderators could also provide tasks in particular threads that were easily accessible to everyone because each thread had a description of the topic for study. When an e-moderator felt that it would be helpful to e-learners, s/he could combine different postings from different e-learners by weaving (Feenberg, 1989) their comments "to add value to participants' contributions...and drawing out a teaching point and invite a response from participants by means of an open question." (Salmon, 2011:207). When a particular topic had been sufficiently discussed "or time is running out", a summary of the postings could be saved (i.e. archived) in

the course module digital archive which was then accessible at any time for immediate reference by e-learners and e-moderators alike. The academic courses which were designed for online learning were not simply a mix of lecture notes and reading materials, accessible online, but had an inbuilt ALN. We, as e-learners, like all novices, had the opportunity to develop our online skills for communication and to learn the ground rules for netiquette (online etiquette). It was also essential to learn not only how to navigate through the different discussion threads but also how to contribute our own ideas to the relevant thread. In this way, e-peers were involved in creating postings with the guidance of an online teacher, an e-moderator, who welcomed everyone entering the online classroom and who provided online tasks, relating to the specific syllabus subject content for the module. All thirty members of the online discussion group were educators. Some were teachers in Secondary Schools and others were lecturers in FE and HE, who were familiar with "the chalk and talk", teacher-centred way of teaching, that is to say instructivist approach or traditional transmission model of teaching

It was possible to recognise how online teachers took the opportunity to monitor, observe the level of knowledge building and intervene when they thought appropriate in a 24/7 framework. By integrating scaffolding into their pedagogical practice the online teacher was able to motivate e-learners, reduce task complexity, provide structure and reduce e-learner frustration (Bruner, 1997a; Berge and Collins, 1995; Salmon, 2011; Garrison and Anderson, 2003). Weaving (Feenberg, 1989), was also skilfully employed by our online teachers who were able to provide appropriate tasks and feedback, with motivational support via text-based postings. Moreover, the summarising and archiving process by the online teacher acted as a useful repository for e-peers to follow-up previous and on-going discussion threads in which they may have been readers and / or writers as discussed by Lave & Wenger's (1991) legitimate peripheral participation. Insights to the nature of non-participation online are also discussed by Bax and Pegrum (2009) and Salmon (2011). A sponge is described by Salmon (2011:245) as a person who is needing "a bit of time to come to terms with the environment, norms and ways of communicating online...(and by giving them)...time and support...they should start to take part."

All thirty members of the online discussion group were educators. Some were teachers in Secondary Schools and others were lecturers in FE and HE familiar with teacher-centred ways of teaching, that is to say an 'instructivist' approach, traditional 'transmission' model of teaching. All newcomers were posted a set of introductory notes (Appendix E) describing the features of an online learning programme, which discussed the collaborative nature of online learning. After an introductory familiarisation session online where the participants were invited by the online tutor to introduce themselves to each other by name, occupation and hobbies, for example, the online tutor divided the group into two groups of fifteen. However, during a later online session in which the groups were asked to research and exchange their views and opinions on a totally

unfamiliar topic (Strategic Marketing) with no online teacher guidance, three participants, two secondary school teachers and an FE lecturer, felt that they no longer could participate and withdrew from the discussion board.

This would account for a 3 out of 15 drop-out rate (20%). Students' expectations of online teacher presence for direction, guidance, and structure were frustrated, as Dirkx and Smith (2004:142) also found. One posted on the chatroom a need for teacher feedback and guidance, not just comments from other peers; another signed off a posting saying "I expect to have some help from the expertise of an online teacher [on topics I don't know]...I feel bewildered by the expectation that we can learn from each other, when clearly we don't." In other words, the interdependence on others that a 'constructivist' learning environment stimulates was unsatisfactory as a learner and member of a group in search of meaningful learning experiences. In the following section, some of the factors around learner disengagement in e-learning environments are considered.

1.2.4 Student Withdrawals: Seeking Explanations

To comment on the above dissatisfaction with the online learning experience, it might be suggested that this online student had not grasped an understanding of a collaborative learning environment. As discussed above in a constructivist learning environment, where interactions occur in three ways (Moore, 1989) in contrast to a one-way teacher to student(s) teacher-led, instructivist environment, students may "hold on to highly subjective and individualistic understanding of teaching and learning [and exhibit] a profound ambivalence...towards collaborative learning methods" (Dirkx and Smith (2004: 132). These students show a preference for teacher-led learning environments.

The tension between 'self' and 'others' in group work that some participants may encounter, i.e. realising one's self as a group member is discussed by Benjamin (1988:19). The self-other relationship is brought into context by what Benjamin refers to as 'intersubjectivity' as follows: "The intersubjective view maintains that the individual grows in and through the relationship to other subjects. Most important, this perspective observes that the other whom the self meets is also a self; a subject in his or her own right. It assumes that we are able and need to recognise the other subject as different and yet alike as another who is capable of sharing similar mental experiences." The shift from individual subjective learning to a socially constructed intersubjective learning environment can be a struggle for some e-learners, as one quoted by researchers Dirkx and Smith (2004:133) laments: "Don't they just lecture anymore? I get so sick of this group stuff."

Jones et al. (2004) conclude that in their experience of delivering the ECW online learning, there were issues with respect to student withdrawals. Those learners who decided to withdraw

included amongst their reasons, feelings of confusion "about using the technology" (p.119), "wanting to have increased flexibility in the course (their difficulty in adhering to strict deadlines)" (p.119), "too many weekly tasks and assignments" (p.119) and "a lack of understanding" "...over-my-head ...confusing" (p.119), "lack of enjoyment of the subject matter" (p.119). Further comments included a preference for traditional classroom lectures– "(I) prefer the chalk and talk and intimacy of an actual lecture" (p.118). Some e-learners too, may have dropped out due to their sense of dis-orientation brought about by the "absence of body" (Stone 1991:56), the key initial difference in online learning, while others may have experienced "the uneasy feeling of disembodiment" when first arriving in the virtual classroom (Haynes and Holmevik, 2000:27). Other researchers (Russo and Benson, 2005:57) have found issues around the related "feeling of isolation".

The learners, described above (Jones et al., 2004), who withdrew, appeared to miss some of what might be called the instructivist (teacher-led) features of a conventional classroom. It is not surprising that students may be frustrated when they are confronted with a constructivist learning environment online. The intimacy of the classroom is also mentioned. There are researchers (Kember, 1989; Frankola, 2001; Berge and Huang, 2004; Tyler-Smith, 2006) who argue that e-learners often suffer from lack of motivation, inexperienced online tutors as well as experiencing cognitive overload, as described in Cognitive Load Theory (de Leeuw and Mayer, 2008). Cognitive overload is also given as a factor contributing to early attrition among first time e-learners. Tyler-Smith (2006:82) recognises cognitive load issues, especially of novice e-learners, suggesting that "it is reasonable to allow more time for the learners to engage with the content and with each other... (and) to design the course in such a way that the early tasks are relatively simple so that early success can be achieved by learners. In longer programmes that may involve a number of component courses, it is recommended that the first course in a programme be short, interesting but relatively undemanding. This allows confidence, capability and technical fluency to be developed by the learners"

Some e-learners, may drop out due to their sense of dis-orientation brought about by the "absence of body" (Stone 1991:56), the key initial difference in online learning, while others may have experienced "the uneasy feeling of disembodiment" when first arriving in the virtual classroom (Haynes and Holmevik, 2000:27). Other researchers (Russo and Benson, 2005:57) have found issues around the related "feeling of isolation"; these issues are discussed further in Chapter Two.

The following discussion considers how experiential learning in an online post-graduate module can lead to innovative approaches for improving online teaching and learning.

1.2.5 Learning about E-Learning though Experience

As a novice e-learner studying a postgraduate business module, a number of puzzling questions began to emerge. For some e-peers, including experienced classroom teachers who were keen to develop their online expertise, it appeared difficult to participate in the online community. For some, online participation came with a sense of foreboding. For others, there was a recognisable excitement and playfulness in collaborating online, where knowledge could be shared through individual postings; some with amusing self-disclosure on how a vexed problem had been overcome. However, when a new, completely unknown topic or concept was presented for discussion, I also found it very difficult to grasp the numerous tasks that were posted – learning online for us needed explanations made more explicit. Thus, one can empathise with e-learners who became 'lurkers' (Kollock and Smith, 1996; Nonnecke and Preece, 2000; Salmon, 2011) – i.e. reading but not posting to discussion forums (Kollock and Smith, 1996) - or who eventually dropped out. Too much information, too fast, too difficult to digest in a short space of time, use of unfamiliar jargon – the complaints of novice learners everywhere - and insufficient time and space to reflect. However, others, who were more familiar with the topic, managed to follow the discussion threads productively. In a constructivist setting, there should be sufficient time to reflect, but on this course, before one could get to grips with an unfamiliar topic, another task would be given without much explanation.

E-learning at this point seemed a difficult project. However, I soon realised that the archived threads were really useful, especially when the e-moderator began weaving, i.e. bringing everyone's contribution into focus with supporting feedback. In some e-learning modules, we received a good amount of feedback from our e-moderator, who intervened on particular points by scaffolding our learning. That is to say, the e-moderator gave us additional support by reducing the complexity of a task by giving us examples of problem solving strategies which at the same time reduced our frustration. McLoughlin and Marshall (2000) observe that the important point about scaffolding is that as the learner becomes actively engaged through the support given there comes a point when the support is no longer needed. In this way scaffolding helps learners to develop skills to perform tasks that would normally have not been possible to accomplish without the support being given in the first instance.

The process of scaffolding requires an e-moderator to intervene giving advice and guidance which might suggest the necessity of a teacher-centred approach (directed instruction) in such circumstances. Salmon (2011:33) puts it like this: "Scaffolding is also a way of gradually moving from what we might call directed instruction to a constructivist approach from short-term needs to the longer term and from immediate to more holistic learning." This kind of intervention, using scaffolding was very useful as well as helpful in pacing the volume of material - but at other times there was very little intervention. That could be quite disheartening when extra

encouragement might have motivated students to contribute thoughts, problem-solving discussion and debate. This is particularly so given that on this initial module, several of the students, like the researcher, were teaching professionals and lecturers, and this new mode of learning was part of our elective on-going professional development. The question as to whether there is some fundamental underlying issue regarding the presence of the online teacher kept cropping up.

This thought-provoking experience provided a springboard to explore the pedagogical nature of e-learning and e-teaching. I wanted to look at why some people enjoyed, even thrived, during the experience and some did not. So discussions with those facilitating the sessions, the e-moderators, who were the virtual teachers, about what they thought they were doing in terms of their activities online, led to a set of research strategies. These strategies included eliciting from e-moderators themselves how they perceive their online roles and relationships, as well as questioning the nature of different pedagogical approaches.

In the next section, I discuss how experiential learning in an online post-graduate module led to an idea for an innovative approach for improving online teaching and learning.

1.3 A Pedagogical Paradox: Instructivist v. Constructivist approach

The ECW course was based on a constructivist principle. The constructivist philosophy (Piaget, 1960; Bruner, 1997; Vygotsky, 1978) was widespread in education and was the orthodoxy of e-learning of the time. The Glamorgan programme was based explicitly on constructivist pedagogy (Lau, Blackey and Jones, 2006:197) as derived from the work of Gilly Salmon, a pioneer research academic in virtual learning and communities, Leicester University. Salmon (2011:53) advocates that "constructivism calls for participants to explore their own thinking and knowledge-building processes: social dialogue is important to trigger knowledge construction." The ECW course authors had several founding assumptions that underpinned the learning environment. Firstly, an underlying assumption is made that all e-learners are capable of actively generating new knowledge online. Secondly, that in online teaching and learning "social factors as well as intellectual factors are important in e-learning and the concept of participation in a learning community is central ..." (Jones, 2004:22).Thirdly, there is an assumption that the online teacher presence, the educator, provides a specific learning framework that is predetermined or as Jones (2004:24) explains "whilst (ECW *online*) courses are pre-ordained, the responses to the tasks often develop into other areas."

It might be argued that such a framework would not actively encourage opportunities for e-learners either to explore or create their own ideas, or to generate their own tasks, external to the pre-ordained framework. Here seems to be an example of a teacher-directed approach (i.e. instructivist) within a so-called constructivist learning environment. This raises a number of

questions.

To set the context for the Glamorgan online course, this was a significant innovation at the time (Jones, 2004). Perhaps as part of the validation process, learning activities and tasks were formally linked to defined assessment outcomes rather than providing opportunities for exploratory learning. So the innovative delivery and design of ECW seemed to lead to assessment parameters and guidelines that were more traditional and less innovative. However, the students were completely new to e-learning and the collaborative constructivist pedagogy did not suit everyone. As evidenced by personal emails and postings in the asynchronous online student chat room, many e-peers in the initial cohort of thirty would have preferred a more teacher-led (instructivist) environment.

This fundamental insight led me to review pedagogy for online teaching and learning. For one reason, not everyone has competence in group working and effective collaboration (Dirx and Smith, 2004). And not everyone enjoys learning in an environment, where teacher presence is invisible. The notion of teacher presence, as Goodyear (1999), Garrison & Anderson (2003) and Swan (2002) have affirmed, plays a key role in online learning with respect to subject expertise, monitoring e-learner progress and providing feedback. The latter includes motivational support, and not just task-giving. There are of course, different lecturing styles too in conventional education e.g. content-driven, context-driven and pedagogically-driven (where the know-how of the teacher is focused on the learner), and it has been observed that early online educational innovations frequently transferred instructional material from stage to screen. The more pedagogically-oriented the lecture, the higher the lecture is rated by students, according to Saroyan and Snell (1997:102), which might suggest a constructivist model, yet in the constructivist model, the visibility of the teacher is supposedly low. Moreover, the e-learning group often does not self-manage (Shirky, 2003, 2008) in the way that constructivists suggest it might; teacher presence is thus important (Garrison and Anderson, 2003:65). There is also an alternative view, in that in certain cultures (e.g. in Asia, see Sue and Kirk, 1972; Joo, 1999; Ziguras, 1999), the preferred online pedagogy is explicitly instructivist as opposed to a constructivist approach.

People have different reactions to a constructivist online classroom, and I was concerned that because of the new orthodoxy of constructivism (Jonassen et al. 1995; Palloff and Pratt, 1999; Bonk et al.,2004; Conrad,2007; Wozniak,2007, Salmon, 2011) people were being treated in a one size fits all model and this was contested by Jones (2004:24) and Moule (2007:38). That question regarding a one-size fits all will be investigated in the chapters to follow.

1.3.1 Shifting Paradigms in online Teaching

To manage change from delivering lectures face to face in the traditional classroom to the virtual

classroom takes much courage. It requires that someone must undergo a change in professional practice, and teachers who become e-moderators for online courses can find themselves in a state of limbo. In the early 2000s there were few guidelines for how to effectively manage this educational change; e-moderators were to abandon instructivism for a new model of constructivism in the delivery of their online modules. Jones (2004:25) observes that "constructivism was not the theory of choice for many lecturers involved in ECW." Because most e-moderators were continuing to practise both in classrooms and online, not all were able to manage both without some qualms i.e. instructivism in the traditional classroom coupled with constructivism in the online classroom. Conrad (2007:200) discusses the "plain hard work of teaching online" pointing to two pertinent questions, namely "what will entice online learners to show up? What will it take to engage them in critical thought?" These two questions focus on the collaborative capability of learners in the first instance and their ability to create knowledge online in the second instance. As a teacher, I thus became interested in how an online teaching system might be designed to provide an environment that would be appropriate for different kinds of online learner behaviours. In a previous research study (Rogers, 2003/4) the findings indicated that e-moderators recognise that certain leadership qualities underpin their online roles and relationships. These qualities, relating to appropriate task-giving and student empowerment are seen to be essential for successful online interactions. These issues are discussed further in the next section.

1.3.2 A Model for '*Pedagogical Variation*'

It was through reflection-on-action (Schön, 1992) during the researcher's experience as an e-learner, and reflection-in-action (Schön, 1992) during e-moderator training, that an innovative approach to online teaching and learning was considered. Concerns about drop-out rates from online courses influenced the approach adopted and the questions to raise. There seemed to be a need to offer a variety of pedagogical approaches in asynchronous learning networks to dispel notions of negative feedback, whereby students drop out of e-learning courses due to the inability of online teachers to encourage and sustain active participation online.. The author (Rogers, 2012/13) presents the term, *Pedagogical Variation* which describes the situational relationship between e-moderating and e-learning. This concept embraces the notion that an e-moderator's pedagogical leadership online with respect to task-giving and motivational support varies according to e-learner online collaborative capability and knowledge construction ability. In the dynamic *Pedagogical Variation* model a reciprocal relationship exists where e-learner online behaviours vary according to e-moderator online behaviours. The *Pedagogical Variation* model, underpinned by a leadership paradigm, shows how online teachers can adopt a combination of pedagogical ways to encourage, foster and

sustain e-learning with the differing online abilities of those e-learners actively participating - or not, as the case may be. To corroborate the model it was important to gather data from experienced practitioners because as suggested by Salmon (2003:89) *"the quality of online learning will be judged as impaired or enhanced by e-moderators' interventions and support."* The next section gives an outline of the way in which a review of the research literature relating to leadership styles shaped the research design.

1.4 Pedagogical Leadership underpinning the Research Design

A previous research study (Rogers, 2003/4) investigated e-moderator perceptions of their online roles through a Leadership Paradigm conceptualised by Avolio and Bass (1994). This Leadership Paradigm consists of three dimensions, namely (i) transactional (ii) transformational and (iii) Laissez-Faire which uses a multifactor-leadership questionnaire (MLQ) to identify certain characteristics in a person's capacity for leadership. After modifying the MLQ by replacing the target research participant 'Executive Director' (Bass and Avolio, 1994) by 'e-moderator' (Rogers 2003/4), the researcher surveyed a sample (n=30) of experienced e-moderating practitioners in HE. As a result four transformational factors emerged as being applicable to e-moderating. These were (i) idealised Behaviour (IB) (ii) inspirational motivation (IM) (iii) intellectual stimulation (IS) and (iv) individualised consideration (IC). The results provided evidence that e-moderators in the sample regarded transformational behaviour (i.e. a behaviour which empowers e-learners, by giving motivational support) as an important aspect of their online role. This aspect is almost lost in the research literature (Berge and Collins, 1995). However, there are numerous citations regarding the necessity of providing structured online tasks (Paulson, 1994; Mason, 2001; Laurillard, 2002; Salmon, 2002a). With a firm belief that e-moderator perceptions of what they do online is underpinned at one and the same time with two critical leadership components, task-giving (a transactional behaviour) and motivational support (a transformational behaviour), the researcher began thinking about how these two components could be brought together to explain their co-existence in a virtual teaching and learning environment. From these early ideas, there emerged an innovative model for online teaching and learning, namely, The *Pedagogical Variation* Model (Rogers 2012) discussed in detail in Chapter Six.

1.4.1 Online Learning fit for the 21st Century

In the first decade of the 21st Century, a number of researchers had experienced the initial introduction of online learning and teaching in their institutions (Cecez-Kecmanovic and Webb, 2000; Salmon, 2011; Palloff and Pratt, 2001; Winograd, 2001; Mchanna, 2002; Ravenscroft, 2002; Conole, 2003; Conrad, 2004; Gulati, 2004; Rogers, 2004; Connolly, Jones

and Turner, 2006; Graff, 2006; Moule, 2007; Wozniak, 2007; Thorpe, 2009). In response to a number of factors including the changing nature of student demographics in HE, the thrust of Lifelong Learning initiatives and evolving use of new learning technologies the UK Government recognised the need to publish three documents (i) *The Future of Higher Education* (DfES, 2003a) and (ii) *Towards a Unified e-learning Strategy* (DfES, 2003b) and (iii) *The e-Strategy: Harnessing Technology, Transforming Learning and Children's Services* (DfES, 2005).

The development of a 10 year unified strategy for e-learning in the UK (DfES, 2005) and the priorities for pedagogical approaches in e-learning indicate a significant move by government to promote investment in online learning and teaching. At the same time the 'Strategy for e-learning' (Higher Education Funding Council in England, HEFCE, 2005) encourages government funding for HE to invest in the setting up of online courses and e-learning research. It is prudent, then, to ensure that online teaching and learning is designed on effective pedagogical approaches rather than driven by technological advances. E-learning is challenging the way in which HE delivers courses to meet the demands of increasingly culturally diverse student populations (i.e. relating to age, gender, nationality, academic and vocational backgrounds).

The aim of HEFCE's strategy is 'to support the HE sector as it moves towards embedding e-learning appropriately, using technology to transform higher education into a more student-focused and flexible system, as part of lifelong learning for all who can benefit' (HEFCE, 2005:5). Three of the major objectives are:

> *'To enable institutions to meet the needs of learners and their own aspirations for development (p.5), by encouraging Higher Education Institutions (HEIs) to develop their own e-learning strategies.
> * 'To support institutions in the strategic planning, change management and process development that is necessary to underpin their development and embedding of e-learning (p.6). This includes 'strategic approaches to sustainable funding, infrastructure development' and the development of teaching quality underpinned by technology.
> * 'To promote learning research, innovation and development that begin with a focus on student learning rather than on developments in technology per se, enabling students to learn through and be supported by technology (p.6). This is to be carried out in partnership with Joint Information Systems Committee (the JISC) and the Higher Education Academy (the Academy), to support the development of 'staff capacity for e-learning'.

The updated HEFCE (2009) document, 'Enhancing learning and teaching through the use of technology: a revised approach to HEFCE's strategy for e- learning ', confirms that HEFCE will continue to work with partners, particularly JISC and the Academy, enhancing excellence in e-teaching is seen as one of the strategic priorities. This means that all staff can expect to be offered opportunities to develop and practise skills for enhancing learning through the use of technology (HEFCE, 2009:13).

Following this introductory background, i.e. reflecting on personal experience as a novice e-learner, exploring relevant contextual issues, and engaging in an outline of the research literature, the next section introduces the central research issue which points to a gap in the field of knowledge in this area of online teaching and learning.

1.5 Pedagogical Leadership in online Teaching and Learning

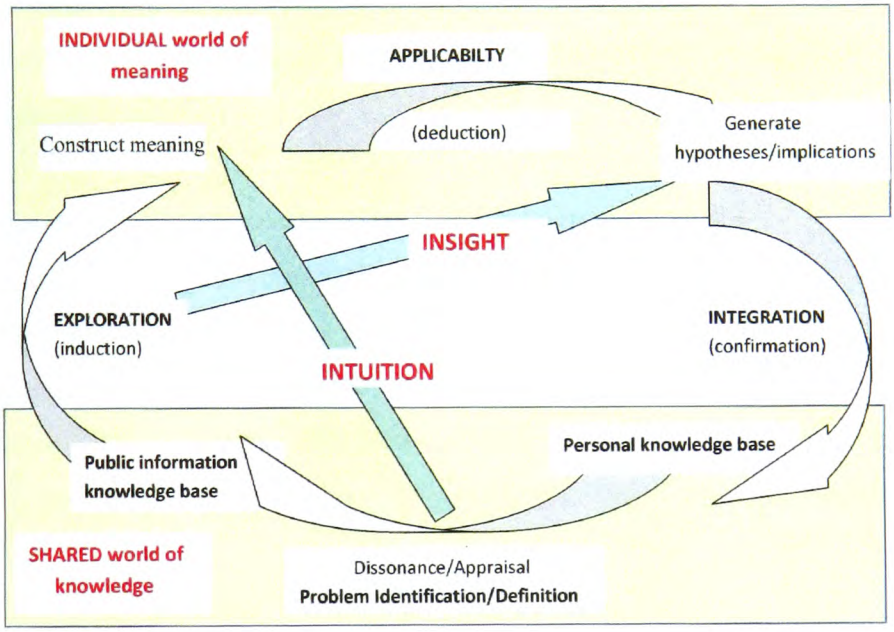
The research study places significant value on the way critical thinking (Dewey 1933/1993; Schön, 1992) about the researcher's experiences as a novice e-learner began to shape the ideas for the research study. By reflecting on these experiences, the researcher gained a deeper understanding of what it means to belong to a community of online learners and was able to engage with the research literature in a personally meaningful way. Theoretical paradigms were interpreted for and implemented in ALNs with a driving emphasis on shifting from an instructivist to a constructivist learning environment (Salmon, 2011; Conrad, 2007; Palloff and Pratt, 1999; Berge, 1995), with claims that a teacher-led (instructivist approach) environment encourages 'surface or shallow learning' and a collaborative, constructivist approach promotes 'deeper or holistic thinking' (Morrison, 2007: 106).

There was something missing in the way in which e-moderators were expected to develop a 'one-size fits all' pedagogical approach (i.e. constructivist). Widening access to FE and HE brings along with it an increasingly diverse student population relating to age, gender, differing educational backgrounds, life experiences, differing professional and vocational insights, culture and race. This diversity, inherent in potential e-learner enrolments caused the researcher to reflect on the nature of pedagogical approaches appropriate for their (i.e. potential e-learner's) level of 'readiness' to enter a virtual learning environment (VLE). Readiness, as described by Grow (1991:126) is a "combination of ability and motivation", ranging from "not able" and "not willing or motivated" to accomplish a particular task to "able and willing" to accomplish a specific task at hand. According to Grow (1991:126) "readiness is situational". This suggests that pedagogical leadership skills are needed to determine an appropriate pedagogical approach to match the level of student readiness for learning in a virtual environment.

Some e-learners may prefer a transmission approach to learning where the learning environment would be teacher-led (i.e. instructivist). Other e-learners may prefer a collaborative, interdependent constructivist approach, while others, characterised as self-directed learners may prefer greater self-autonomy with less interdependence and intersubjectivity (Gulati.2004; Dirkx and Smith, 2004). These perspectives led to an initial conceptualisation for developing an innovative pedagogical model for online teaching and

learning. Online learning with a pedagogical conceptualisation based totally on constructivism appeared to raise some problems for e-learners (Dirkx and Smith, 2004) including the researcher. These problems emerged because the researcher had moved from a shared world of knowledge (Fig.1.1) about e-learning to making her experiences meaningful for herself; it was part of an imaginative leap with intuition and insight, which played a significant part in conceptualising a new pedagogical model. Figure 1.2, shows how insight comes from exploration and intuition arises from experience. For Dewey (1967) intuition and insight is the union of perception and reason.

Figure 1.2 Critical thinking and intuition (Source: Garrison and Anderson, 2003:57)



Accepting the orthodoxy that a constructivist learning environment would be suitable for all e-learners alike caused concern. Dirkx and Smith (2004) reveal that their online students demonstrated "a profound ambivalence toward online collaborative learning, fuelled in part by the emotional dynamics associated with the forces of individuation and group development." It is confirmed by Wozniak (2007:215) that students do not "take advantage of the collaborative environment...The assumptions that students would automatically practice group dynamics as they had in face-to-face sessions and also interact well to reach group consensus on answers were proven to be incorrect." This was a problem which the researcher had identified also through experiential learning as a novice e-learner, thereby giving the researcher the basis for an *intuitive* understanding (as shown in Figure 1.2) regarding the link between leadership and teaching, which had been established in previous research (Rogers, 2003/4).

There were gaps in the research literature regarding not only differing collaborative capabilities and knowledge construction abilities amongst e-learners, but also how online teachers might accommodate their online roles and relations to their e-learner online behaviours. For Fiedler (1978) there is no ideal leader, but effective leadership will depend on the situation as to whether it is contingent to be task-oriented or relationship-oriented. This contingency model suggests that there are two types of leadership styles for a given situation, (i) task-oriented and (ii) relationship-oriented. Fiedler's ideas make sense with respect to teaching style and classroom situation, i.e. in giving consideration to the learning behaviours of e-learners online. The previous sections have introduced the way in which a gap in the field of knowledge regarding online teaching and learning was recognised. The basis for this was not only exploitation of relevant research literature, critical thinking and experiential knowledge but also personal insight and intuition. The next section provides insight to the researcher's experiences during an e-moderator training course.

1.6 Experiencing E-Moderator Training: Reflection-in-action

The practice-based knowledge, what Schön (1992) calls reflection-in-action, enabled the researcher to identify a research strategy for developing an innovative pedagogical model based on a leadership paradigm. The following section discusses the significance of online 'presence'. Salmon (2011:215) advocates various ways of creating 'presence'. For example mentioning each participant by name "is very motivating and a fine way to acknowledge contributions."

1.6.1 The invisible 'other': Presentation of 'self'

Palmer (1998:2) contends that "We teach who we are. Teaching is like any truly human activity, emerges from one's own inwardness, for better or worse." Both Gabriel (2007:176) and Conrad (2007:194) use this perspective when exploring online teaching styles. These researchers recognise that online tutors need to reflect on their own personal beliefs, values, assumptions and teaching approaches. Conrad (2007:194) puts it like this: "In online teaching, the contribution of your 'self' – your heart – is critical to the success of the venture." It was also observed by Conrad (2007:201) that "Teachers' self-knowledge and sense of authenticity also helps them (teachers) to promote their learners' sense of self. Knowing who you are as a teacher empowers you to empower others." Gornall (1999), drawing on work in anthropology, discusses the issues of 'visibility' and 'otherness' in new learning professional staffs' behaviours and working contexts. We may also add Goffman's (1961:45) concept of 'presentation of (real) self' because Salmon (2011:37) like Conrad (2007:199) and Wozniak (2007:213) urge e-moderators to develop skills to draw e-learners into active online participation. Goffman (1961:45) uses the term 'absorption' or 'engrossment' to describe the

force that draws us into an encounter such as a game. His concept of 'absorption' refers to the sharing of purpose among people who do not form a community but have accepted a common work or play as the context for an intense, temporary relationship. The term fairly describes some electronic discussion group participants, who are almost 'lost (i.e. *absorbed*) within their electronic interactivity' (Stone 1991:56). Miller's (1995) analysis of Goffman's (1959) presentation of self in the virtual classroom was the researcher's first realisation that there was more to e-moderating than using the facilities presented by the technological infrastructure. Interest in the ways in which electronic communication "will become more human" (Miller, 1995:2), compelled the researcher to put technology-driven learning aside and put in its place pedagogy-driven learning. The recurring question was around the development of "effective" online learning in the context of a community of e-learners. In order to explore this further, the researcher decided to participate in an e-moderating module, to find out how sound practice for online teaching might be developed.

1.6.2 Learning to E-moderate: Salmon's Five-stage Model

The e-moderation course was designed using Salmon's (2011) five-stage model, in which, for example, her concept of 'knowledge construction' (stage 4) was seen to be one of the most important and difficult stages for online tutors to manage. The novice participants were reluctant to seek help, either from e-peers or the online teacher, and some online tutors did not seem to be able to cope with online group work. Whilst it is true that a constructivist approach seems to be most appropriate for online learning and teaching (Garrison and Anderson, 2003), not everyone has the initial capability of collaborating with others. Learners felt bewildered and tended to question not their own skills but the educational rationale for the course and underlying learning designs. There are those that believe (Berge, 1995; Pitt and Clark, 1997; Holmes and Gardner, 2006; Swan, 2006) that it is quite possible to successfully foster and build a community of e-learners from those who were initially intimidated by new learning technologies as a teaching mode (Nonnecke and Preece, 2000).

By the time Salmon's Stage five was reached, e-Peers had experimented with several online strategies, namely (i) socialising (ii) knowledge construction (iii) weaving (drawing contributions together from different participants) (iv) summarising and (v) archiving. We were now ready to experience intervening, by learning how to apply the process of scaffolding, to facilitate collaboration within a constructivist e-learner environment.

This experience of e-moderator training, based solely on a collaborative and constructivist online learning environment, provided the impetus to consider designing an alternative blueprint for effective and adaptable online learning and teaching based on a leadership paradigm.

1.7 Research Question

The above initial insights helped to shape the research question which is stated below:

To what extent can an adaptable model for online teaching and learning be based on a leadership paradigm and data from e-moderator perceptions of their roles and relationships online in Asynchronous Learning Networks?

1.7.1 Research Aim

The aim of the research was to develop an adaptable model for online learning and teaching ***based on a leadership paradigm*** and by using data from e-moderators and their perceptions of their online roles and relations in ALNs.

. This aim is underpinned by six main objectives:

1. To focus critically on the literature with particular reference to different models for teaching and learning in general and online in particular;
2. to focus critically on the literature with particular reference to leadership, in particular to situated leadership;
3. to conceptualize and develop a hypothetical model for online teaching and learning using a leadership paradigm;
4. to elicit e-moderator perceptions of their online roles and relationships in asynchronous discussion forums;
5. to corroborate the emerging conceptual model with data from (4);
6. to evaluate the hypothetical model for online teaching and learning by hypothesis testing.

The review of the research literature was useful in evaluating and shaping the research design. Through the literature review, gaps in knowledge regarding effective online teaching and learning in relation to implementing different pedagogical approaches in a holistic manner through pedagogical leadership were identified.

Before giving a summary of the research design in Section 1.9 of this introductory chapter, the next section indicates, briefly, some ways in which researchers have investigated factors that were found to be conducive to sound practice in learning and teaching online.

1.8 Pedagogical Models for Online Teaching

At the beginning of the research investigation and after experiencing another e-moderating course online led by David Sheppard, an associate of Gilly Salmon, the researcher began to recognise pedagogical limitations in a "one size fits all" model for online teaching and learning. This is discussed in Chapter Four. By the time the researcher started to conceptualise

her own model for online teaching, one using a 'leadership' paradigm, Moule (2007) had published her ladder-wise conceptual model for online teaching and learning. This model, which moves in a linear way from an 'instructivist' to a 'constructivist' approach, is discussed in the review of the research literature (Chapter Four). In the end, neither the step-wise nor the ladder-wise models offered a complete picture of an effective e-learning community for this research. In the researcher's experience, online collaboration as the sharing and building of new ideas does not happen as much as these models suggest. There are several omissions in the models, which are dealt with in Chapter Four. In Chapter Five the *Pedagogical Variation Model* is discussed as an alternative model for online teaching.

At this point, it was important to consider gathering insights from e-moderators themselves. As practitioners, their practical knowledge and skills would provide an invaluable contribution. The creation of a *Pedagogical Variation* model would give online teachers a combination of pedagogical ways to encourage, foster and sustain e-learning with regard to the differing teaching preferences and online learning capabilities of e-learners actively participating.

What follows is a summary of the research objectives and methodologies, results and conclusions of focusing on creating a new model, which should be seen as a contribution to this developing field of knowledge. The researcher adopts an innovative approach in bringing theoretical work on personal construct psychology and related methodologies together in this study. The aim of this inquiry was to create an adaptable model for online learning based on a leadership paradigm and data from e-moderator perceptions of their roles and relationships in ALNs.

1.9 Summary of the Research Design

After a critical review of the research literature, the four main objectives which support the research question are (i) the conceptualisation of a hypothetical model for online learning and teaching based on a leadership paradigm (ii) the elicitation of e-moderator perceptions of their online roles and relationships in asynchronous discussion forums (iii) the corroboration of the hypothetical model using data from (ii) and finally objective (iv) evaluating the hypothetical model by a Hypothesis Testing procedure.

The thesis gives a comprehensive discussion of the theoretical background and research rationale in Part One. This is followed by Part Two which discusses the research methodology and data collection techniques. In Part Three the data analysis and interpretation of the findings relating to the overall research aim are presented.

1.10 Research Assumptions: Limitations

This section describes the hypothetical model relating to the assumptions made in selecting a methodology for each of the two empirical studies which contribute to the research investigation.

Goudner (1971: 50-55) suggests that "viewed from one standpoint, methodology seems a purely technical concern devoid of ideology...It is a good deal more than that, for it is commonly infused with ideologically-resonant assumptions about what the social world is and what the nature of the relation between them is". These comments made the researcher explore the research assumptions more rigorously. There are a number of things that could be done differently if starting again. Firstly, personal construct psychology methodology led to a very large amount of data, which was difficult to code and manage, with the time limits imposed. A better, more direct method would have been the use of a questionnaire with specific points about how e-moderators viewed their online teaching and leadership skills with respect to online learners' "diverse preferences of learning" (Gulati, 2004:1).

The following table shows a framework for describing both the subjective and objective dimensions that underpin research design, and is adapted from Burrell and Morgan (1979:3):

Table 1.1 The Subjective and Objective Dimensions underpinning Research Rationale

Subjective Dimension		Objective Dimension
Nominalism	Ontology	Realism
Anti-Positivism	Epistemology	Positivism
Voluntarism	Human Nature	Determinism
Ideographic	Methodology	Nomothetic

This is a useful tabulation, because if one adopts the philosophical assumptions of positivism with its related epistemological insights, then this would lead to a nomothetic methodological approach. On the other hand, an anti-positivist approach led the researcher to an interpretive rationale based on an ideographic methodology. This formulation helped the researcher make sense of a number of both epistemological questions and positions encountered during the research – and indeed which were raised by the research – and led to consideration of methods, objectives and achievements.

During the initial stages of the research inquiry, it was important to ascertain an appropriate methodology for the overall research design: i.e. conceptualisation of a new pedagogical model, data gathering using personal construct psychology and devising a data analysis instrument for the corroboration of the new hypothetical model using content analysis (Empirical Study 1) and implementing an online questionnaire for Hypothesis Testing (Empirical Study 2). The limitations of a quantitative approach demanding a large sample population was identified. E-moderating practitioners are not found in abundance. They are scattered far and wide. Such is the nature of working in online networks. There are also problems with investigating small-scale sample populations with qualitative semi-structured interviews in terms of the limitations for generalizability and interpretation of findings. It was recognised that personal construct psychology (Kelly, 1989) would be a sound starting point, at the time, because as concluded by Schön (1992) knowledge gained by reflection-on-action is invaluable to gain insight to the work of an experienced practitioner.

The emergence of a pedagogical model as a 2 x 2 matrix (discussed earlier) brings into being a graphical description of a delicate balancing act. Thus the degree of e-moderator transactional task-giving and the degree of transformational motivational feedback are set against each other, and then a second 2 x 2 matrix can be used to show the degree of e-learner collaborative capabilities and the degree of e-learner knowledge construction abilities. Other pedagogical models discussed earlier, namely the five-stage stepwise model (Salmon, 2011) and the ladderwise model (Moule 2007), do not sufficiently explain the differentiation in teaching style adapted according to the e-learner culture. The two matrix sets are fully described in Part Two, together with the emergent *Pedagogical Variation Model.*

This model was openly scrutinised, by a sample of e-moderating practitioners, for falsification (Popper, 2002). The findings thereof demonstrated that the *Pedagogical Variation Model* tentatively withstood such examination. This does not mean that the good fit of empirical data and the hypothesis *proves* the hypothesis, but rather allows for continuing debate and research. As Dooley (1984:36) concludes, "*Hypothesis testing is the procedure whereby theory and reality are brought face to face with each other.*" The researcher offers the new innovative online teaching and learning model not only for the continuing professional development of e-moderator practitioners and instructional designers, but also as a means to support e-learners with diverse learning preferences to enjoy their online learning experiences in a creative and meaningful way.

1.11 Summary

A number of research strategies helped to identify distinct methods for data collection, appropriate to the study at the time. The investigation is innovative, there being no research studies incorporating the personal construct psychology conceptualisation for researching online learning and teaching. This is perhaps surprising given that personal construct psychology has been with us for over fifty years, with many adoptions and adaptations by various research studies and schools.

The research is up to date and its pioneering approach in looking at *teacher* roles and relationships online has provided rich findings within the parameters of a small-scale study. The resulting analysis has produced what is a distinctive model for learning and teaching online, and one that has led to the development of the unique *Pedagogical Variation Model.* This is an original terminology, coined by the researcher as a contribution to this field of knowledge in ALNs. As Lave and Wenger (1991), have commented, "Learning, thinking and knowing are relations among people...with and arising from the socially and culturally structured world" (1991:50-51).

The rationale in the research is to get beyond imitating traditional technologies and approaches to teaching and learning. The research study underpins the need for researchers to explore further their understanding of the multiplicative properties of asynchronous online learning. This means moving beyond the additive novelty of asynchronous online learning "that replicates the delivery of lectures over a computer and the internet enhanced with multimedia analogues to the overheads of a lecture" (Garrison & Anderson, 2007). Unreflective adoption of past practices will not help us understand the *multiplicative properties* of communicative freedom, information access, and individual control of time and space for the purpose of creating an expanded cognitive presence and effective higher-order learning experiences and outcomes.

From a philosophical perspective, it is observed that pragmatic insights into online pedagogy and e-learner autonomy can be translated into a collaborative-constructivist approach to learning (Garrison & Archer, 2000). That is, combining the stimulation and feedback of a collaborative and socially shared approach with reflective inquiry and personal responsibility to construct meaning. The task now is to identify how e-moderators implement pedagogical leadership strategies to identify both student-led and teacher-led discussions, where appropriate, within ALNs in a way that will enhance cognitive presence and learning effectiveness.

Chapter Two

Introduction: Online Teaching and Learning

2.0 Background to the Research

The 2005 DfES e-strategy *Harnessing Technology: Transforming learning and children's services* emphasises a collaborative approach to the provision of personalised learning, and plans for an integrated teaching, research and administrative network for education. The strategy proposes common systems and open standards for electronic learning (e-learning), and the development of functional e-collaborative partnerships as an explicit strategic priority. Cross-institutional partnerships are seen as a way of enabling all schools, colleges and universities to progress.

The DfES (2003) recognises the multidimensional developments in international standards and specifications for e-learning content. There are now, increasingly powerful ways of describing the emergence of computer mediated educational materials/resources and online web-courses, designed by an international community of e-learning designers. E-moderation, at the same time, is beginning to evolve within culturally diverse learning environments and the need for continuing professional development is seen to be at the heart of the e-moderating community. In this way e-moderators recognise the need to respond effectively to cultural diversity within global contexts. The Joint Information Systems Committee (JISC, 2003) is leading, with international partners including the Australian Department of Education, Science and Training (DEST), an initiative to build '*the e-Framework for Education and Research*'. This is a common, service-oriented approach to the development and integration of computer systems in the sphere of learning, research and education administration. The e-Framework is the result of a shared conviction that it is better to expose networked functions, such as user/group data or learning content, as simple services rather than as features locked up inside monolithic systems. This approach offers institutions more flexibility, more scope for pedagogic innovation and better return on present and future investment.

The Government's e-learning strategy points to the need for effective learning design tools to help practitioners develop and deliver their own learning activities. My research aims to

decrease the gap in knowledge where there is little indication that leadership qualities in online teachers bring about successful online teaching and learning (Rogers, 2004, 2005).

Hiltz (1994:5) coined the expression *Virtual Classroom* "for the social invention of building and operating computer-mediated communication systems to support dispersed communities of active learners." With the globally widespread implementation (DfES, 2003) and increasing use of asynchronous learning networks (ALNs) in Virtual Learning Environments (VLEs) in UK Higher Education (HE) and Further Education (FE), there has been a demand from e-moderating practitioners for more effective guidance on good pedagogical practice (JISC, 2003). A specific call has been for help in designing e-learning activities in these environments. Developments in learning design offer new ways of integrating materials and activities in a pedagogically informed way (Goodyear, 2002; Thorpe, 2009). These developments also offer richer frameworks for modelling socio-cultural cognitive interactions (Vygotsky, 1978; Garrison and Anderson, 2003; Russo and Benson, 2005; Bass and Elmendorf, 2009) in virtual learning spaces.

2.1 The Research Rationale

Underpinning the research was the assumption that there are certain qualities, e.g. knowledge of online learning technologies, expertise in using computer-mediated communication skills, creative problem-solving, socialising and online knowledge sharing amongst others, which online teachers exhibit. To find out how teaching and learning is conducted online, the research study critically explored, from the research literature the many features associated with pedagogical conceptual frameworks found both in traditional face-to-face and virtual classrooms.

The absence of the notion of pedagogical leadership was noted by Garrison and Anderson (2003:70) who point out how "...the teacher's scholarly leadership...a legitimate and important authoritative, essential teaching responsibility has been either ignored or downgraded," in online learning environments. The concept of teaching presence (Anderson, Rourke, Garrison and Archer, 2001) is constitutively defined as having three categories - design and organization, facilitating discourse, and direct instruction. Direct instruction suggest a component of 'instructivism'., where the online teacher's expertise and 'scholarly' leadership qualities are recognised, in contrast to an online tutor participating in an online discussion forum as equals to e-Peers.

The research was carried out to address this gap in knowledge, regarding pedagogical leadership in online teaching, by developing a model for online teachers, based on e-moderator leadership qualities (Rogers, 2004) for teaching and learning in asynchronous discussion forums. This research aim was underpinned by the research question:

> To what extent can an adaptable model for online teaching and learning be based on a leadership paradigm and data from e-moderator perceptions of their roles and relationships online?

As a result of an extensive review of the research literature, four main research objectives resulted in the research design, namely:

1. To conceptualize and develop a model for online teaching and learning;
2. to elicit e-moderator perceptions of their online roles and relationships in asynchronous discussion forums;
3. to corroborate the emerging conceptual framework with data from (ii);
4. to evaluate the hypothetical model for online teaching and learning.

A hypothetico-deductive methodology was selected (Chapter Five) because the conceptualization of three testable hypothetical models for online teaching and learning became the starting point for the empirical investigation (Chapter Five). These three models, prescribing how e-moderating ought to consider e-learner online behaviours in their online teaching, were corroborated by data from an empirical study adapting personal construct psychology (Chapter Seven) to elicit e-moderator perceptions about (i) what they do online and (ii) what their e-learners are able to do online. The corroborated hypothetical *Pedagogical Variation* model (Chapter Eight) was presented as a falsifying model (Popper 2002) to the orthodox constructivist online teaching and learning theoretical framework.

The falsifying model, the *Pedagogical Variation* model, underwent hypothesis testing to prove or disprove the claims made (Chapter Ten). It was recognised that the hypothetical *Pedagogical Variation* model can never be fully confirmed because it may be disproved/refuted, at a later date, with further open scrutiny by refined research methods (Dooley, 1984; Willig, 2001; Popper, 2002; Babbie, 2004).

Before examining different pedagogical models in the literature review, (Chapter Four), characteristic features, underlying the context in which online teaching and learning were investigated, are explored. These characteristics, namely invisible identities of e-peers and

e-moderator in VLEs, asynchronicity of ALNs, Reflection in online teaching and learning, collaborative knowledge construction and e-moderating competencies are examined in the following sections.

2.2 The Virtual Classroom: Invisibility of the 'other'

"The challenge of creating a cohesive community of inquiry in a medium that provides no visual clues, other than words or images on a screen presents a unique challenge for educators."(Garrison and Anderson, 2003:48). Without the physical presence, that is to say "absence of body" (Stone, 1991:81) in the virtual classroom, computer-mediated communication can develop a sense of total impersonality. Personal identities through presentation of self by non-verbal behaviours (Goffman, 1959) of real people become invisible as their virtual identities become visible in online social interaction in their virtual existence (Miller,1995). Stone (1991:84) claims that for some people an imaginary *e*-self emerges, with ideas and thoughts quite different from the original person. "Sometimes a person's online persona becomes so finely developed that it begins to take over their life off the net". Baym (1995:139/140) concedes that "because computer-mediated interactants are unable to see, hear and feel one another, they cannot use the usual contextualisation cues conveyed by appearance, non-verbal signals and features of the physical context. With these cues of social context removed, the discourse is left in a social vacuum, quite different from face-to-face interaction." This 'invisibility if the other' (Gornall, 1999) creates a need to develop alternative skills for effective online communication.

In a face-to-face discourse facial expressions have powerful communicative qualities, especially the presence or absence of eye-contact (Riches, 1992). Complex forms of behaviour, called phatic functions by semiologists, are a frequent occurrence in everyday person-to-person dialogue. A verbal exchange such as 'nice morning, isn't it?' is an example of a phatic function which conveys a sense of sociability rather than communicating a specific meaning. Whilst text-based online communication allows such verbal exchanges, it is in the absence of visual facial expressions or hands gestures or nodding of the head and as such is devoid of real physical human encounter.

For online learning to become an effective way to develop new knowledge, either independently or collaboratively, technical skills have also to be learnt. For example, with regard to a person's disposition to technology-driven systems, Mezirow (1990:130)

concludes that "perspectives are transformed when learners encounter disorientating dilemmas . . . that cause anxiety and inaction. By simply getting involved in an online class, a learner immediately encounters a disorientating dilemma. This is a new medium in which participants interact differently and in which students are expected to engage with material, each other and the instructor in a completely different way." For some students the virtual classroom is impersonal and isolating, causing them to disengage by dropping out of their course, unable to finish it. For others there might be a psychological problem of absence of physical body and the sense of the invisible others (i.e. e-peers and online tutor) causing students to do the minimum to complete the course, but not coming online i.e. lurking behaviour (Mazzolini and Maddison, 2003: Romiszowski and Mason, 2004).

The 'invisibility of the other' also creates difficulties not only at a personal level but also at a social level. Participants in online distance education can feel isolated due to lack of person-to-person contact and both students and tutors may feel uncomfortable with the use of student-centred, collaborative, transformational learning activities because they change the traditional social structure of a transactional, teacher-centred classroom environment. Creating a friendly social environment for learning (Turkle, 1997) is seen as an essential e-moderator skill. Sending welcome messages at the beginning of a module and encouraging participation throughout are specific examples, but providing continuous feedback on students' inputs, and using a friendly, personal tone are equally important (Paulsen, 1992)

The paradox of 'talking without seeing' is well researched by Kraut, Fussell and Seigal (2003:15) who show that where people share greater amount of common ground, i.e. if they are members of the same group or population, (e.g. same undergraduate on-line cohort) they can construct and expand their common ground over the course of interactivity on the basis of linguistic co-presence. They can share common ground to physical co-presence when they inhabit the same physical setting, e.g. belonging (enrolling) to the same university campus.

Within virtual classrooms interaction among students and between students and the instructor and a high quality of content and instruction are desired features of all courses (Mowen and Parks, 1997; Schrum and Berge, 1998). An emerging question is whether online tutors are able to emulate this kind of flexible teaching which on the one hand is constructivist and on the other hand instructivist. Hull and Saxon (2009) investigated negotiation of meanings in online knowledge construction through social interaction

amongst teachers during an online professional development course. By using an experimental approach, implementing the intentional manipulation of tutor interventions, open-ended questioning and frequency of tutor feedback, 782 e-learner postings were analysed from the total sample (n=24). Hull and Saxon (2009:637) raised *"concerns about whether or not instructors employ instructional strategies that influence social knowledge construction and subsequent learning outcomes from asynchronous online courses."* The research findings seem to indicate, paradoxically, that the social construction of knowledge in a constructivist environment does not happen in the absence of an online teacher. Whatever happens to course and programme structures, there is ample evidence that the human factor – the role of the e-moderator will be critical in the acceptability and success of online learning communities.

In the next section the nature of asynchronous learning networks (ALNs) is discussed as the research investigation is based on teaching and learning in VLEs in general and ALNs in particular.

2.3 The nature of asynchronous learning networks in VLEs

The properties, of asynchronous learning networks are that they allow for communication of text messages from one person to many or many persons to one. A good definition of asynchronous is given by Pallof and Pratt (1999:189) who define it as "a type of communication that can occur at any time and at irregular intervals, meaning that people can communicate online without a pattern of interaction. It is the predominant mode of communication used in emails, UseNet groups and on bulletin boards and websites." This type of communication is in direct contrast to one which is synchronous where participants are communicating in real-time. The spontaneity of this type of communication promotes immediate responses which may be seen as a disadvantage (Berge, 1995; Garrison, 2003) because the time-lag in the asynchronous medium allows for messages to be sent at any time. The advantage then is that e-learners and the e-moderator, online teacher, can communicate in a relaxed way with the opportunity to reflect on each other's online contribution.

Garrison and Anderson, (2003:83) reiterate that it is not only the asynchronous (i.e. reflective) characteristics, which contribute to the effectiveness of online learning and teaching, but also the properties of connectivity (i.e. collaborative feature) within the

computerised networks. These researchers conclude that "asynchronous communication inherently provides for both reflection (construct) and discourse (contribute). The manifold opportunities to socialise online offer a multiplicity of learning opportunities in a community that learns to socialise where the social construction of knowledge is said to become evident. Berger & Luckman (1966:173) argue about reciprocity in the establishment of both identity and social relations. Berger and Luckman conclude that "...identity is formed by social processes. Once crystallized, it is maintained, modified, or even reshaped by social relations...Conversely, the identities produced by the interplay of organism, individual consciousness and social structure react upon the given social structure, maintaining it, modifying it, or even reshaping it."

The challenge for the teacher is to know when to emphasise reflection and when to emphasise discourse. At the beginning of a learning experience, considerable structure and support is required to establish cognitive presence. Historically Dewey (1933), who himself drew on the ideas of many earlier educators such as Plato, Aristotle, Confucius, Lao Tzu, Solomon and Buddha (Houston, 1988), is acknowledged as a key originator in the twentieth century of the concept of reflection. He considered it to be a special form of problem solving, thinking to resolve an issue which involved active chaining, a careful ordering of ideas linking each with its predecessors. Within the reflective process, consideration is to be given to any form of knowledge or belief involved and the grounds for its support, (Adler, 1991a; Cutler, Cook & Young, 1989; Calderhead, 1989; Gilson, 1989; Farrah, 1988, Schön, 1983).

The potential of integrating asynchronicity and connectivity in e-learning brings together both private and public worlds on the learning and teaching platform. This, in my view, is the strength of e-learning and the essence of collaborative student-centred online inquiry. Garrison and Anderson (2003:86) point out that "to 'lecture' online is to negate the power and capability of e-learning and most detrimentally to turn students into passive receptacles of information." This teacher-centred approach, however, may suit some students who are uncomfortable and experience difficulties in collaborating with e-peers online.

In an ECW E-Moderating Programme for continuing professional development (2003) the researcher experienced how the asynchronous nature of computer mediated conferencing allows e-learners the opportunity to take time to reflect on their contributions and respond, in their selected threads. At the same time the researcher learnt how online teachers take

the opportunity to monitor, observe the level of knowledge construction and intervene when they think appropriate in a 24/7 framework. By scaffolding (Bruner, 1997a; Berge and Collins, 1995; Salmon, 2000; Garrison and Anderson, 2003) and weaving (Feenberg, 1989), online teachers are able to provide appropriate tasks and feedback, with motivational support via text based postings. Moreover, the summarising and archiving process by an online teacher, acts as a useful repository for e-learners to follow-up previous and ongoing discussion threads in which they may or may not have participated.

Within asynchronous electronic discussion groups, e-learners enjoy the freedom of studying at their own pace, in their own time and place. It is vital, therefore, to be able to offer opportunities, through computer-mediated learning strategies, for promoting lifelong learning to a diverse e-learning audience. Since an ALN offer opportunities for reflection, particularly in problem-solving online, it is useful to discuss the merits of this way of thinking, in the next section.

2.4 Definitions of Reflection and their Implications for e-moderating

This section explores the different theoretical perspectives related to the process of reflection, because online learning and teaching in ALNs offers many opportunities for reflection by both e-learners and e-moderators alike during online text-based postings to one another. Four key issues with regard to reflection emerge from Dewey's original work and its subsequent interpretation. The first is whether reflection is limited to thought processes about action, or is more inextricably bound up in action, (Noffke & Brennan, 1988; Grant & Zeichner, 1984). The second relates to the time frames within which reflection takes place, and whether it is relatively immediate and short term, or rather more extended and systematic, as Dewey seems to imply, (Farrah, 1988; Schön, 1983). The third has to do with whether reflection is by its very nature problem-centred or not, (Adler, 1991; Calderhead, 1989; Schön, 1987). Finally, the fourth is concerned with how consciously the one reflecting takes account of wider historic, cultural and political values or beliefs in framing and reframing practical problems to which solutions are being sought, a process which has been identified as critical reflection, (Gore & Zeichner, 1991; Smyth, 1989; Noordhoff & Kleinfeld, 1988).

In relation to reflective thinking versus reflective action, there seems to be wide agreement that reflection is a special form of thought, (Sparks-Langer & Colton, 1991; McNamara,

1990; Kremer-Hayon et al., 1999; Waxman et al., 1988). But Dewey himself also spoke of reflective action presumably addressing the implementation of solutions once problems had been thought through, and it is clear that most writers are concerned with the complete cycle of professional doing coupled with reflection which then leads to modified action (Noffke & Brennan, 1988; Gore & Zeichner, 1984). It may be useful to contrast this cyclical idea with routine action, which derives from impulse, tradition or authority. Reflective action is bound up with persistent and careful consideration of practice in the light of knowledge and beliefs, showing attitudes of open-mindedness, responsibility, and wholeheartedness, (Noffke & Brennan, 1988).

Schön (1983; 1987) writes about reflection that is intimately bound up with action. Rather than attempting to apply scientific theories and concepts to practical situations, he holds that professionals should learn to frame and reframe the often complex and ambiguous problems they are facing, test out various interpretations, and then modify their actions as a result. He talks about reflection-on-action and reflection-in-action, the latter implying conscious thinking and modification while on the job. But both his forms of reflection involve demanding rational and moral processes in making reasoned judgements about preferable ways to act.

A further issue related to the links between reflective thought and action concerns the time frames within which both occur. Schön's reflection-in-action (1983;1987) involves simultaneous reflecting and doing, implying that the professional has reached a stage of competence where she or he is able to think consciously about what is taking place and modify actions virtually instantaneously. Most other kinds of reflection involve looking back upon action some time after it has taken place. Certain models of what has been termed technical reflection (Killen, 1989; Cruikshank, 1985) appear to be based on thinking about skills or competencies with a view to evaluating their effectiveness almost immediately after an attempt at implementation, and then making changes to behaviour. Other models of reflection (Gore & Zeichner, 1991; Smith & Lovat, 1991) are based on encouraging deliberation over a relatively extended time about the purposes of action with a view to exploring alternatives which might be implemented in the future. Indeed, some seem to argue that reflection involves conscious detachment from an activity followed by a distinct period of contemplation (Buchman, 1990; Pugach, 1990; Boud, Keogh & Walker, 1985).With regard to reflection and problem solving, while there is some consensus that

reflection is centrally concerned with finding solutions to real problems (Adler, 1991; Calderhead, 1989; Cutler, Cook & Young, 1989), questions can be raised about whether solving problems should be considered an inherent characteristic of reflection. Some proponents would argue by their logic or practice that its essential nature is thinking about action. This may involve processing while a group event is taking place or debriefing after a specific experience for the purpose of developing insights, in terms of a clearer understanding of the relationships between what took place, the purposes intended, and difficulties which arose viewed within broader cultural or professional perspectives.

The term critical reflection, like reflection itself, appears to be used loosely, some taking it to mean no more than constructive self-criticism of one's actions with a view to improvement, (Calderhead, 1989). It can be argued however that the concept of critical reflection implies the acceptance of a particular ideology, along with its accompanying assumptions and epistemology, (McNamara, 1990; Zeichner & Liston, 1990; Gore, 1987; Wildman & Niles, 1987). Taken together, these form a particular theoretical framework for reflection, as outlined below. The one outlined by Dewey (1933) to some extent illustrates these points, as do the frameworks of Zeichner (1983) and Smith (2000) and their associates, especially in terms of what is the particular focus point of any reflection (Nofke & Brennan, 1988).

Critiques of reflection (Gore, 1987) often make use of the hierarchy outlined by van Manen (1977), who proposed three levels derived from Habermas (1973). The first level, *technical reflection*, is concerned with the efficiency and effectiveness of means to achieve certain ends, which themselves are not open to criticism or modification. The second, *practical reflection*, allows for open examination not only of means, but also of goals, the assumptions upon which these are based, and the actual outcomes. This kind of reflecting, in contrast to the technical form, recognises that meanings are not absolute, but are embedded in, and negotiated through, language. The third level, *critical reflection*, as well as including emphases from the previous two, also calls for considerations involving moral and ethical criteria (Gore & Zeichner, 1991; Adler, 1991), making judgements about whether professional activity is equitable, just and respectful of persons or not. That is to say that it is justifiable for e-moderators to intervene in a discussion forum when there seem to be potential conflicts amongst e-peers in expressing strong personal opinions, for example. In addition, critical reflection locates any analysis of personal action within wider

socio-historical and politico-cultural contexts (Smith & Lovat, 1991; Noffke & Brennan, 1988; Zeichner & Liston, 1987).

Schön's framework is able to incorporate all levels or kinds, including critical reflection. His *reflection-in-action* and *reflection-on-action* involve an epistemology of professional practice based upon knowing-in-action and knowledge-in-action (Altricher & Posch, 1989; Munby & Russell, 1989). Such tacit knowledge in e-moderating is derived from the construction and reconstruction of professional experience, in contrast to applying technical or scientific rationality (Adler, 1991; Schön, 1983, 1987; Polanyi, 1958, 1967). Reflection-in-action, an element of knowing-in-action, occurs while an action is being undertaken. It is therefore seen to be one means for distinguishing professional from non-professional practice, (Feiman-Nemser, 1990; Schön, 1983, 1987). It may be characterised as part of the artistry or intuitive knowledge derived from professional experience (Gilson, 1989) and includes engaging in a reflective conversation with oneself, shaping the situation in terms of the reflector's frame of reference, while consistently leaving open the possibility of reframing by employing techniques of holistic appraisal (Altrichter & Posch, 1989).

While different contexts in teacher education may lend themselves more to one kind or level of reflection than another (Calderhead, 1989), it is important that the types are not viewed as an increasingly desirable hierarchy. Technical reflection is an essential aspect of initial e-moderator development and a precursor to other kinds of reflection (Gore & Zeichner, 1991; Hall, 1985; Fuller, 1970). For example, Cruikshank's reflective teaching involves the use of microteaching to assist in developing student teacher competence, (Cruikshank, 1985; Cruikshank, Kennedy, Williams, Holton & Faye, 1981). While claims about the benefits of this approach have been asserted, (Killen, 1989), little research evidence has been presented, and any reflection involved seems to be fairly superficial, confined to whether ends have been achieved. Nonetheless, it may constitute a basis for providing tools which will enable other forms of reflection to develop. But the argument that teacher (e-moderator) education should also be concerned with questions of equity and justice, developed through strategies which stimulate critical reflection, has been advanced with some vigour (Cutler, Cook & Young, 1989; Smyth, 1989; Noffke & Brennan, 1988).

Dewey's basic ideas are seminal, and indicate that reflection may be seen as an active and deliberative cognitive process, involving sequences of interconnected ideas which take

account of underlying beliefs and knowledge. Garrison and Anderson, (2007:56) conclude that "critical thinking, both authenticates existing knowledge and generates new knowledge which suggests an intimate connection with education." The practice of reflection develops an understanding of what things are about and the way in which a person gains insight of their own individual relationship and engagement in their online learning. That is to say "the study pleasure and motivation" (Holmberg, 1989:43) which a reflective approach to learning emulates. The asynchronicity of online learning discussion forums allows online learners to engage in their online reflective postings at any time, from any place at irregular intervals (Laurillard, 1997). Through reflective practice (Schön, 1992) online learners are able to exchange shared experiences to generate new ideas and give each other feedback. Palloff and Pratt (1999:121) conclude how important it is to build into an online course "the expectation that students will provide constructive and extensive feedback to each other.. . .The ability to give meaningful feedback, which helps others to think about the work they have produced, is not a naturally acquired skill. It must be taught, modelled and encouraged by the online instructor." Other researchers, Mazzolini and Madison, (2003) and Romiszowski and Mason (2004) note that there is insufficient research on infrequent contributors (i.e. passive recipients rather than actively engaged learners online). However it might be the case that these students prefer to read the postings and archived materials. This in turn can be conceived as engagement through reflection and could not be considered as passive.

Reflective thinking generally addresses practical problems, allowing for doubt and perplexity before possible solutions are reached. In online asynchronous learning discussion groups the process of reflective thinking allows both e-peers and e-moderators to consider each other's online contributions before engaging in further discussions. This allows for the emergence of new ideas and creative solutions to task-oriented problem-solving. Effective online teachers should have opportunities to continually develop their skills of reflection-in-action and reflection-on-action when interacting with their online learning communities. E-learners should also be encouraged to develop their reflection-in-action and reflection-on-action in generating their shared problem-solving activities. In my experience of online teaching and learning a reflective approach develops not only problem-solving skills but also creative thinking. It is through creative thinking that an e-moderator has the opportunity to encourage e-learner collaboration.

The next section discusses how a competency-based teacher education has influenced the understanding of putting theory into practice.

2.5 Collaboration and Knowledge Construction in ALNs

The connectivity afforded by online teaching and learning platforms has the capability of bringing students together from diverse socio-cultural backgrounds. This is advantageous for the building of a community of learners (Graff, 2006; Wenger, 1998) who are able to communicate through the electronic medium from any location, at any time. Hiltz (1994:23) defines collaborative learning as an environment in which: "both teachers and learners are active participants in the learning process; knowledge is not something that is 'delivered' to students but rather something that emerges from active dialogue among those who seek to understand and apply concepts and techniques. The virtual classroom demands this kind of learning in order to overcome the absence of face-to-face communication."

Through socialisation, Feenberg (1989) concludes that learning in a faceless classroom becomes more effective when an online teacher weaves e-peers' contributions together in such a way to create group cohesion. Garrison and Anderson (2003:48) talk about social presence as an important factor for online learning communities to develop their skills in collaborating and sharing their ideas to generate new knowledge. Online learning is seen by many researchers through a constructivist lens. For example, Mason (1998b:3) states that constructivist thought could be encouraged through learner participation in structured online discussions, collaborative online activities, online assessment, interactive course material and the changing of the teacher from a 'sage' to a 'guide'. The ability for an online teacher on how to bring about effective participation is discussed by Hrastinski (2008). Construction of Knowledge is both individual (Paiget, 1951; Kelly, 1955) and social (Dewey, 1933; Vygotsky, 1978).There is an underlying assumption that the basis of collaborative learning is that learning is social rather than individual. Collaborative learning in virtual classrooms is encouraged because there is an assumption that more information and knowledge can be gained through the interaction and involvement with virtual class members than solely from an online teacher.

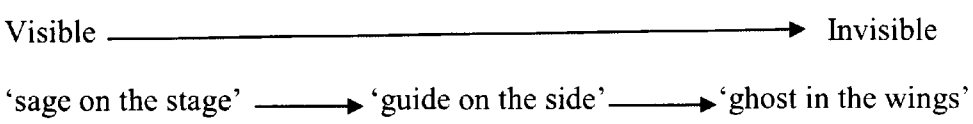
The research study challenges this assumption, on the grounds that in some online discussion groups there is little e-learner participation or involvement (Garrison and

Anderson, 2003:44). A 2003 study carried out by Wozniak (2007:215) implemented Salmon's (2000) conference rating categories using two raters. The findings confirmed that from 756 postings in an ALN discussion forum, 93% demonstrated 'individual thinking' (i.e. individual ideas, explanations, personal opinions) and 7% 'interactive thinking' (i.e. critique of other e-peers' suggestions, challenging others' explanations, negotiating new meanings). In comparison, independent learning differs from collaborative learning in that the student does not interact with other students. In such environments interaction takes place exclusively between the teacher and the student and learning is completely self-directed (Hiltz, 1994:24).

From the e-moderator perspective, Mazzolini and Maddison (2003) recognise that there is a spectrum of activity offered by e-moderators. In some instances an e-moderator will remain the 'sage on the stage', others prefer to be present as a 'guide on the side' while others use a discussion forum as a repository for notes and resources. This e-moderating behaviour is described as being 'a ghost in the wings'. Visibility is often seen to be as 'teacher in front of the class' i.e. "sage on the stage", but online visibility may also be observed in the way in which an experienced online tutor uses his/'her expertise to scaffold and provide feedback to e-peers.

The following diagram illustrates this spectrum of e-moderating activity adapted from Wozniak (2007:214).

Figure 2.1 A continuum of e-moderating (Wozniak, 2007:214)



Wozniak (2007:214) used her conceptual continuum to illustrate the difficulties she encountered "with limited resources and one e-moderator for 50 students with an average of 30 postings per semester, it was necessary to adopt the invisible style. To reduce the time drain from managing so many messages students were given clear guidance that it was their responsibility to monitor their own contributions and participation." King(1993:30) concludes that when a professor "functions as a 'guide-on-the-side', the professor is facilitating learning in less directive ways...that make the students do something with the information, interact with it, manipulate the ideas and relate them to

what they already know...in their knowledge-producing endeavour." The online tutor has the opportunity to create a pedagogical presence through their leadership skills in visibly guiding online debates through provoking questioning. The notion of an invisible sage, through exceptional design can be exemplified by fostering the design of "pedagogically appropriate e-tivities" (Armellini and Aiyegbayo, 2010:922). Morgan and Belfer (2007:236) note that as instructional designers themselves, it is essential to recognise the type of pedagogical approach to be adopted i.e. learner-centred (preference for tutor invisibility) or tutor-led (preference for tutor visibility). Their suggestions for designing a visible learner-centred approach (i.e. constructivist learning environment) might look like the following:

1. The learning design involves the presentation of a question to the forum by a student or group of students;
2. A period of time is given (or indefinitely) for thye question to be discussed;
3. Relative freedom is given to the students to participate and shape the path of the discussion.

In a visible tutor-led (i.e. instructivist learning environment) the underlying design may look like the following, suggested by Morgan and Belfer (2007:236):

1. The discussion is begun by a pre-established question from the tutor;
2. According to very specific guidelines, the students respond once to the discussion;
3. The discussion is closed by the tutor, after a specified period of time.

These observations demonstrate the diversity in e-moderator behaviours online. The research aims to identify the applicability of varying degrees of online teacher presence suitable for online learning groups with differing degrees of online collaboration and knowledge creation. The research suggests that an online teacher will need to develop skills to identify how best to help an individual member in an online learning group or how to satisfy the needs of the group. The next section deals with how online teaching can be developed and supported through competency-based teacher education.

2.6 Competency-based teacher education for online teaching

Competence is a contested concept; the meaning of which is shaped by those who use it (Chappell 1996).Competency-based education is perceived by some as *the* answer, by

others as the wrong answer, to the improvement of education and training for the complex contemporary world (Harris et al. 1995).

Proponents of competency-based teacher education promote it as a way to improve the correspondence between education/training and workplace requirements (Harris et al. 1995). It is individualized, emphasizes outcomes (what individuals know and can do), and allows flexible pathways for achieving the outcomes. It makes as clear as possible what is to be achieved and the standards for measuring achievement. In theory, it overcomes the divide between hands and mind, theory and practice, general and vocational education.

For its opponents, competency-based teacher education is excessively reductionist, narrow, rigid, atomized, and theoretically, empirically, and pedagogically unsound (Chappell 1996; Hyland 1994). Both sides seem to agree that these criticisms are valid when competence is conceptualized in behavioural terms. The behaviourist framework breaks down competence into the performance of discrete tasks, identified by functional analysis of work roles. This analysis is the basis for competency statements or standards upon which competence is assessed and toward achievement of which competency-based teacher education is directed. Behaviourism is criticized for ignoring the connections between tasks; the attributes that underlie performance; the meaning, intention, or disposition to act; the context of performance; and the effect of interpersonal and ethical aspects (Hyland 1994). Because of the complexity and indeterminate nature of real-world situations, "behavioural objectives can never be achieved in practice with the precision they offer in theory" (Jackson 1994:139). Instead, studies of the development of expertise as well as the constructivist view of learning suggest that people make judgments and review, reflect on, and change behaviour, continually reconstructing relevant and useful knowledge as they interact with a situation (Hodkinson and Issitt 1995; Hyland 1994).

Another major objection is that "100 years of educational, psychological, organizational, and cultural research has largely been ignored" (Collins 1993:89). In particular, the behaviourist conception of skill and competence as individual and value free is contradicted by recent research suggesting that skills are social constructions or cultural practices (Collins 1993; Harris et al. 1995). In addition, "the validity of measurement techniques associated with the behavioural model of learning are problematic as indicators of significant learning" (Barrie and Pace 1997:340). In particular, the checklist approach, in which a competency is achieved/not achieved or a person (e-moderator) can/cannot

perform a particular task is considered simplistic and demotivating, suggesting a minimum level of acceptable performance rather than a standard of excellence. Although behaviourism is only one competency-based approach, it has been the most promoted and influential (Jones and Moore 1995), in part because it is easier to specify task-based behaviours than identify and describe underlying attributes (Harris et al. 1995). However, Hager (1995) suggests that many critics are arguing against this old, discredited model when in reality competency-based teacher education has accommodated different conceptions of competence. One of these involves the inclusion of generic attributes underlying competent performance (such as knowledge and understanding). There are still disagreements over the existence of such context-free attributes, the transferability of these attributes, and the attempt to describe knowledge, understanding, cognition, and attitudes as behavioural objectives when they are not behaviours (Hyland 1994).

An even broader approach to competence is variously termed integrated, holistic, or relational. An integrated view sees competence as a complex combination of knowledge, attitudes, skills, and values displayed in the context of task performance (Hager, 1995). This approach recognizes levels of competence-entry/novice, experienced, specialist-rather than a once for all attainment. Interpreted broadly, competence is not trained behaviour but thoughtful capabilities and a developmental process (Barrie and Pace 1997; Chappell 1996). Rather than a single acceptable outcome, performance may be demonstrable and/or defensible in variable contexts (Chappell, 1996). A relational view is similarly holistic, acknowledging the cultural context and social practices involved in competent performance, reflecting how personal attributes are used to achieve outcomes in jobs located within organizational relationships located within broader relationships with the labour market and society (Jones and Moore 1995; Toohey et al. 1995).

Competency-based teacher (e-moderator) education interpreted broadly could thus be compatible with a cognitive view of learning, unlike its behaviourist form, which Hyland (1994:336) declares "largely unsuitable for the teaching and learning which goes on in higher education institutions, whether this occurs in general/academic or professional/vocational contexts". However, in practice, competencies are being specified and assessed too narrowly (Toohey et al. 1995) and can work to hinder education and training. Even the broader competencies, some may say, still emphasize performance and outcomes over knowledge and cognition (Jackson, 1994; Hyland, 1994).

Salmon (2004) concludes how important it is to identify and describe the range of models that inform the design and implementation of e-learning activities. Salmon (2004:34) has coined the term e-tivities, to describe such online learning tasks.

The development of e-moderating competencies through e-moderator training courses is a beginning. It is through experience, and sometimes by trial-and-error, that effective e-moderating skills develop. Hyman, (1980:13-17) concludes online learning involves formal or informal leadership or moderation. The research study attempts to address pedagogical leadership qualities such as intellectual stimulation, individual consideration, constructive transactions (Bass and Avolio, 1993) to develop a pedagogical model for online teaching and learning to help those online students who find it difficult to collaborate and construct knowledge with others online. Fee (2009:42) states that "We need a paradigm shift from the caricature of e-learning as a narrow set of isolated learning activities, unsuitable for many learners and many learning situations, to a new vision of e-learning as a broad approach to learning in the digital age, encompassing rich and dynamic possibilities, engaging learners and looking to the future."

2.7 Summary

This chapter discussed the background to the research including the role of government initiatives (DfES, 2003/2005) to promote online teaching and learning in HE and FE through collaborative institutional partnerships. The research aim is stated with the four main research objectives after an extensive critical review of the research literature.

Joint international research initiatives are developing online learning materials for widening access to web-courses and resources. Both JISC and DEST are developing online programmes for dissemination to e-learner practitioners to enable them to develop their own customised online courses. Research is also supported for the creation of continuing professional development courses for e-moderating practitioners. The research study considers the need to decrease the gap of knowledge where there is little evidence that e-moderating requires leadership qualities for effective online teaching and learning in asynchronous discussion forums. The research aim focuses on the development of an adaptable model for online learning and teaching based on a leadership paradigm and by using data from e-moderators and their perceptions of their online roles and relationships in ALNs.

The chapter includes a discussion on the nature of absence of body in virtual learning

spaces. For some people the absence of physical presence is uncomfortable, dis-orienting and becomes a deterrent for online collaboration with e-peers. This is unfortunate because the asynchronicity of ALNs brings opportunities for self-reflection which is a powerful means to gain insights to understanding how to develop problem-solving skills with e-peers, through the characteristic connectivity afforded by ALNs.

In Section 2.4 I emphasised the different types of reflective practice observed by a number of researchers so as to be able to locate this way of thinking as an essential component in both online teaching and learning across culturally diverse learning communities. Particularly useful in the understanding of how e-moderators ought to develop their online skills, is the distinction between reflection-on-action and reflection-in-action i.e. developing insights to tacit knowledge-in-action and tacit knowledge-on-action. A discussion on the nature of online collaboration and knowledge creation in ALNs is introduced both from e-learner and e-moderator perspectives, in Section 2.5. Diagram 2.1 illustrates a continuum of e-moderator online activity from being visible to becoming invisible which underpins significant pedagogical issues relating to teacher-centred and learner-centred teaching and learning online. This section is followed by a discussion on competency-based teacher education.

The concept of competency-based e-moderator training is seen as a necessary part of continuing professional development. A discussion of the advantages and disadvantages of competency-based teacher education concluded that, for some observers, competencies were seen as a means to achieving pre-set goals, whilst for others competencies were too rigid, inflexible and unpractical. An alternative approach was viewed as holistic, i.e. a complex combination of knowledge, attitudes, skills, and values determining e-moderator performance.

The question of acquiring skills to develop collaboration and knowledge construction in online learning communities is important because of the invisibility of e-peers to one another and their e-moderator. In the next chapter, Chapter Three, the research rationale is discussed by exploring different pedagogical concepts that have shaped the research design. For example (i) the paradoxical nature of two diametrically opposing pedagogical approaches, namely instructivist (high teacher visibility) and constructivist (low teacher visibility) and (ii) pedagogical leadership in ALNs provide contributing insights to the development of the research design in the creation of a new dimension for online learning and teaching..

Chapter Three

RESEARCH RATIONALE

3.0 The Research Rationale: Background

The JISC e-learning Pedagogy Programme (2003) recognised the demand from practitioners in e-moderating who called for "more effective guidance on good pedagogical practice" because of the "widespread implementation and increase of VLEs in UK HE and FE" (JISC, 2003:15).

There is more evidence to show the urgency of not only developing but also implementing sound pedagogical practices for online learning and teaching. The evidence comes from the seventh annual report (2009) by the Sloan Foundation, *"Learning on Demand: Online Education in the United States, 2009"* regarding the position of online learning in Higher Education, in the U.S.A. The purpose of the report, as in previous years, is to identify both the nature and extent of online learning as a response to address fundamental issues that frequently emerge. Focusing on one of the key questions, namely, 'How Many Students are Learning Online? ', I find some pertinent answers. Firstly, online enrolments have been growing rapidly for the past six years, so much so that their growth, with no signs of slowing, has been faster than overall student enrolments in U.S. Higher Education. The researcher has no reservations in quoting American data on this subject because, from an international perspective, this resonates with what is happening in those parts of the world such as Australia, Africa, Asia and also now in Europe where online learning in some instances is the only means of access to education. The Sloan Foundation Report (2009) concludes that students (over 4.6 million) were studying by online courses in the autumn of 2008, showing an increase of 17% from the previous year. This increase was reported to be far greater than the growth in the HE student population of the same year, which was 1.2%. Based on this evidence it was estimated that more than 25% of the population of students at college and university study at least one online course. Despite a serious search for comparable UK statistics from sources such as The Higher Education Statistics Agency (HESA), The Higher Education Funding Council in England (HEFCE), the Open University (OU) and the Borderless Observatory for Distance Learning and JISC it was impossible to find UK statistics that were comparable to the U.S. statistics quoted above. A study on E-Learning Provision in the UK (Oxford University, March 2010) indicates that

currently no UK statistics for enrolments, retention and attrition rates in E-Learning are available. The evidence for this was found in a footnote as follows: "HEFCE's analytical services group confirmed on 5 February 2010 that there was no way of identifying online distance learning from existing data collected by HESA ." (White, Warren, Faughnan, and Manton, 2010, p.11, Footnote[11]).

Hiltz, Zhang and Turoff (2002:15) already recognised that there was overwhelming evidence that asynchronous learning networks tend "to be as or more effective than traditional modes of course delivery at the university level." These researchers urge that what is needed is "more research that will enable us to make online learning even more effective, especially as new technologies proliferate." Harasim, (1996) also makes the same observation.

On the other hand, eight years on, Boston et al. (2010), in their research about e-learning attrition rates, concluded that the number of drop-outs from online-learning far exceeds that of traditional face-to-face learning programmes (Boston et al., 2010). It could be suggested that this may be due to ineffective models for online learning in virtual classrooms which try to mimic traditional face-to-face classrooms.

The investigation is a timely one for three reasons. The first reason is related to the increasing number of e-learners who are dropping out of their online learning courses. Secondly, the study was undertaken to meet the growing demands for pedagogically sound online learning programmes for the ubiquitous and widespread application of e-learning. The last but not least reason is the enormous global potential for new ways of learning and teaching online.

The research became challengingly complex, especially selecting a research question and a methodology which would serve to explore answers to the research question. Dooley (1984:33) gives his advice about selecting a research question. He concludes that "questions which are worth answering are ones that have not already been answered or that are not trivial in a scientific or social sense." He suggests that "answerability is another good criterion of a good question. One characteristic of answerable questions is that they are manageable" and "based on propositions that can be disconfirmed. Good theories produce clear predictions which can be clearly supported or contradicted by observation".

In the same way Popper (2002:66) states "the urgency of replacing a falsified hypothesis by a better one."

3.1 A Pedagogical Paradox: Constructivism/Instructivism

By finding out about online discussion forums and e-moderator practices it became more and more evident that constructivism is the more prevalent pedagogy implemented in online discussion forums, suggesting that there is no room for an instructivist approach. This is questionable because there is evidence that in some cultural contexts (Joo, 1999; Nadler, 1989; Ziguras, 1999 and educational environments (Grow, 1991 and Pratt, 1988) an instructivist approach in learning and teaching is preferred. There is a gap in the research literature regarding the nature of asynchronous online learning and teaching with little explicit application of an instructivist paradigm.

The tabulation below shows the different characteristics between online constructivist teaching and learning and an instructivist pedagogical paradigm, much used in traditional face-to-face classrooms. In a student-centred online learning community the visibility of the online teacher is minimised whilst in teacher-centred classrooms the visibility of the teacher is maximised.

Table 3.1 below shows key features of the paradoxical nature between a constructivist learning environment and an instructivist one. The two pedagogical paradigms show diametrically opposing characteristics that are currently employed supporting very differing learning environments and could be said to constitute a conflict paradigm (Dooley, 2004:36-37)

Table 3.1 Key features of two different pedagogical Approaches: Constructivist v. Instructivist.

Constructivist	Instructivist
• *Student-centred* • *Facilitation of knowledge construction* • *Promotes Collaborative learning* • *Evolving forms of assessment* • *Requires descriptive bottom-up planning*	• *Teacher-centred* • *Importance of teaching skills in orderly sequence* • *Promotes Individual learning* • *Traditional assessment method* • *Requires prescriptive top-down-planning*

A constructivist approach is where through bottom-up planning, student-led discussions are encouraged with formative assessment. Students are given the freedom to formulate

questions, exchange their own ideas by sharing and producing new ideas. Gulati (2004:3) contends that "the key points that the constructivist discourse suggests is the importance of learner-control, learning in real-life contexts, flexibility in learning, freedom to choose learning resources and openness in discussing issues. These aspects of learning are often commonly found in what Freire (1972) calls radical learning outside the control of formal educational hegemony." In contrast, a teacher-led, traditional instructivist approach is such that the questions are formulated by the teacher and discussion is teacher-led and knowledge is transmitted and produced by close monitoring of student responses and continuous scaffolding with summative assessment. There are examples in the research literature giving comparisons between teacher-led and student-led discussions. De Volder et al. (1985:648) conclude that "the academic achievement of health sciences students whose discussion group was led by staff teachers was compared with those whose group was led by peers. Higher achievement was found in the staff-led group, but there was no difference in achievement in groups led by high-achieving and average-achieving students." Gulati (2004:5) questions how some online courses which are based on pre- defined course syllabi, schedules and requirements for participation in online discussions can be described as a constructivist approach to learning. "There is an assumption that collaboration in teacher-defined tasks and questions in online courses is learner-centred and flexible, because it allows learners with flexible access to online discourse and learning materials in their own time."

Reflecting on the research carried out by Goodfellow, Lea, Gonzalez and Mason (2001), there seems to be an implicit warning that constructivism may not suit all online students because of their cultural and linguistic characteristics. For example, international students from South East Asian are often found to be less self-directed learners who defer more to the authority of the teacher and who prefer more structured learning environments (Ballard & Clanchy, 1997; Biggs, 1997; Kelly & Tak, 1998; Smith & Smith, 1999).

Goodfellow, Lea, Gonzalez, and Mason (2001) reveal their concerns regarding the way in which academic institutions attempt to initiate a sense of globality by promoting cross-cultural interaction, in order to offer access to their e-learning courses for a world-wide community of learners. These researchers express their views about redressing the factors of inequality emerging when students are exposed to linguistic differences,

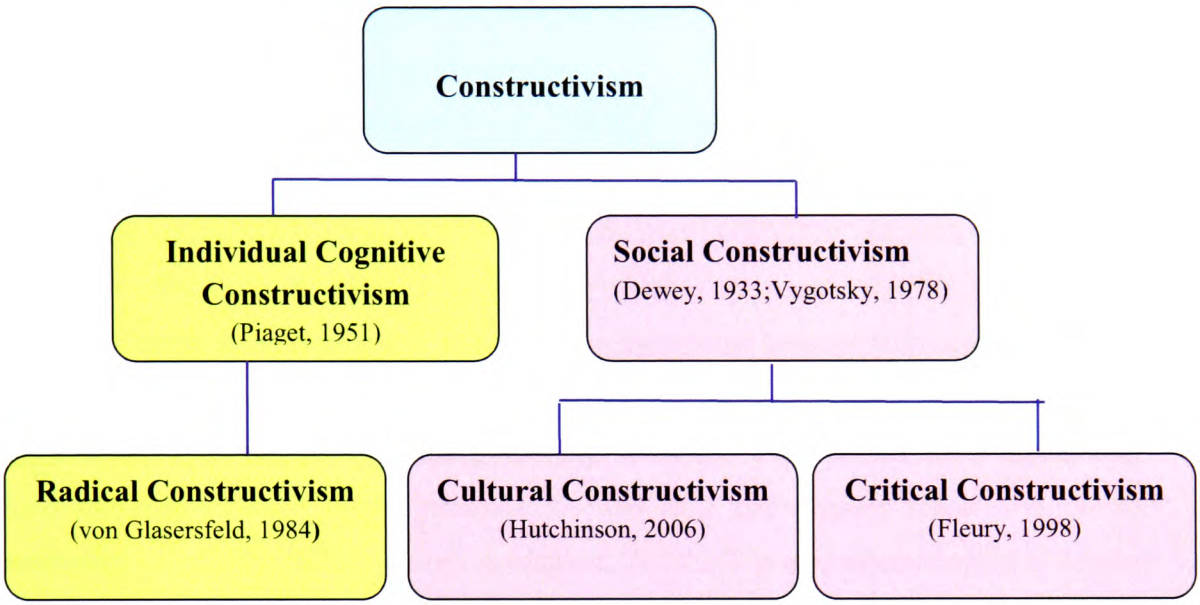
perceptions of globality, academic conventions and cultural otherness (i.e. socio-constructivist) in rigidly prescribed e-learning environments (Goodfellow, Lea, Gonzalez, and Mason, 2001:65). In many countries belonging to the Asian continent, an instructivist, teacher-centred approach still remains popular, especially in India, China and Japan. Ziguras (1999:402) argues that " ...while interactive educational technologies may be appropriate in countries in which self-directed study and student autonomy are emphasised, the same uses of technology may not be as appropriate in South East Asian countries in which education has traditionally been more tightly structured and teacher-directed." Other researchers share this viewpoint. For example, Joo (1999:247) concludes that because the Internet offers a means for pro-active learning and teaching "...it may affect the balance of power in countries where the educational system is centralised and authoritarian... In societies where discipline and submission to authority is praised rather than individualism and freedom, teachers might feel too uncomfortable to take initiatives, to accept the scrutiny of peers, or to hand greater control to their students. Likewise, students accustomed to traditional methods may find it hard to adapt to active and innovating learning techniques." It is argued that it is not only some Eastern cultures that favour an instructivist approach but also in traditional Western cultures, instructivism may be the preferred learning environment, especially in the education of students who are unable to cope with a self directed learning environment. Grow (1991:129) contends that "...dependent learners need an authority figure to give them explicit directions on what to do, how to do it and when." This points to the necessity of a teacher-centred educational rationale. It may turn out that some students are temporarily dependent in some subject areas. According to Pratt (1988:168) such students "lack relevant knowledge, skills and experience or the motivation and self-confidence to pursue educational goals."

3.2 Different Aspects of Constructivism

Constructivism may be seen from two main different viewpoints i.e. the individual cognitive perspective and the social perspective. In all learning situations, whether formal or informal, online or off-line, individuals will construe meaning for themselves and also in learning communities at an individual level (Piaget, 1951; von Glasersfeld, 1984). From a social constructivist perspective (Dewey, 1933; Vygotsky, 1978; Jonassen et al.,1995; Fleury, 1998; Kincheloe, 2005) members of a learning community will construe meanings

together, sharing and exchanging ideas with one another These two perspectives form an umbrella over differing aspects of constructivism are shown in Chart 3.1, below.

Chart 3.1 Different aspects of Constructivism



Importance is attached to these aspects because when reading the research literature, constructivism seems to be used loosely, with hidden assumptions (Gulati, 2004). Considering individual cognitive constructivism as propounded by Piaget (1951), all learners employ their own constructs to make meaning of the world. On this basis individual constructivism will occur in all learning communities to some extent or another. The radical constructivism which von Glasersfeld (1984) and Freire (1987) uphold is an extreme form of personal identity and personal freedom to explore the world in a subjective manner, where knowledge is self-organised by the brain. Alternatively, social constructivism is viewed in social contexts. People will learn from one another. (Vygotsky, 1978, Dewey, 1933). Both cultural and critical constructivism are also seen to occur in social settings. Regarding critical constructivism, Kincheloe (2005:57) argues that "...the self is infinitely more malleable, more open to change ...this dimension of selfhood can be mobilized for great benefit or manipulated for great harm." With respect to cultural constructivism, Hutchinson (2006:301) concludes that "knowledge is created in the crucible of culture, and is mediated by the nature of nature. In the teaching of diverse students, teachers need to understand the process by which cultural paradigms, juxtaposed to the process of knowledge construction, may potentially create multiple realities for

different students. When teaching diverse students, therefore, teachers need the heightened awareness by which they can more effectively decipher student knowledge."

The next chapter, Chapter Four, reviews different models for online teaching and learning with a particular focus on what kind of constructivist approaches researchers had adopted, or not, to underpin their theoretical frameworks.

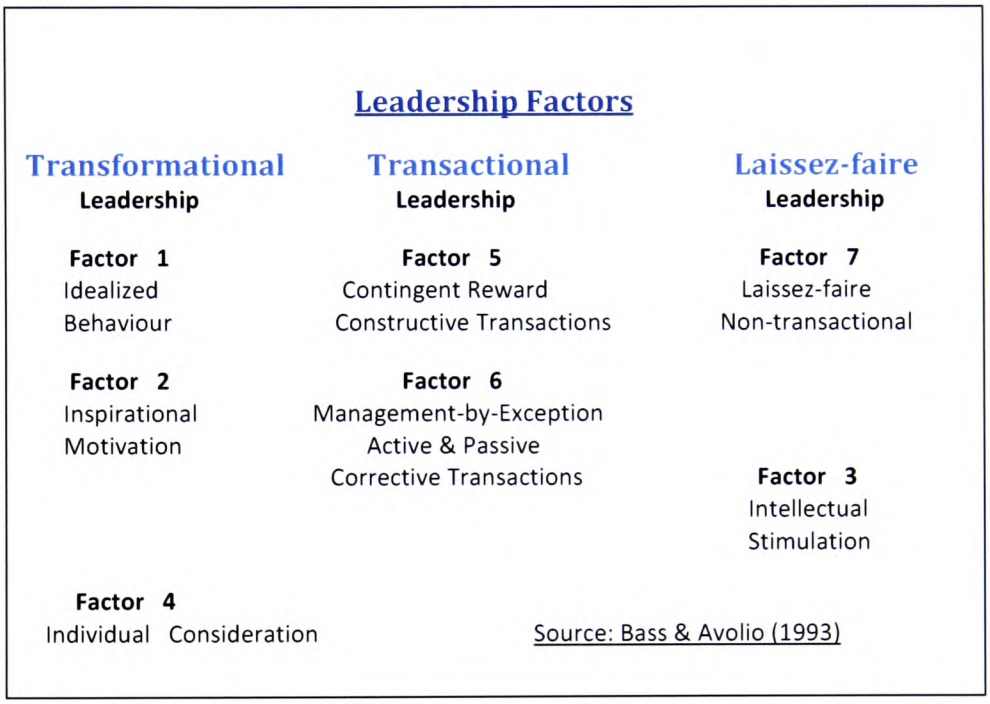
For self-directed, autonomous learners a different pedagogical approach is necessary. Garcia and Pintrich (1994:143) conclude that self-directed students are capable of "monitoring, controlling, and regulating their own cognitive activities and actual behaviour." That is to say that self-regulated e-learners take responsibility for their own learning by being actively engaged with the learning process through reflection and critical thinking. Grow (1991) recognises that encouraging learners to become self-directed will inspire students to engage in lifelong learning. This has implications for e-moderating where the e-moderator's online presence is vital as a pedagogical leader. An online community of inquiry (Garrison and Anderson, 2003:28) is self-organising to a certain extent, where e-learners have opportunities" to negotiate meanings, diagnose misconceptions and challenge accepted beliefs." With access to vast store of information on the Internet, online learners have a distinct advantage to engage in deep and meaningful learning outcomes within a community of reflective inquiry.

3.3 Pedagogical Leadership in Online Teaching and Learning

It was important to the study to develop an argument for the significance of leadership qualities in online teaching because the *Pedagogical Variation* Model is based on a Transactional Leadership construct, namely task-giving and a Transformational Leadership construct, namely "motivational support/empowerment" (Bass and Avolio,(1989) This Model is the contribution to knowledge arising from the PhD Investigation. The MAPD Study (Rogers, 2004) led to the conclusion that in a sample of e-moderators(n=30), using the multifactor e-leadership questionnaire (Appendices B2 and B3, Rogers (2004), MAPD study) found that e-moderating incorporated a significant degree of (i) inspirational motivation, (ii) intellectual stimulation (iii) Individual consideration and (iv) idealised (role-model) behaviour. The current research study takes the 'leadership paradigm from an individual level (i.e. e-moderator competencies) into a higher level using leadership as a basis to underpin the hypothetical *Pedagogical Variation* Model (coined by Rogers, 2009) for online teaching and learning in ALNs.

A fundamental assumption in the study relates to qualities of leadership in the online practice of e-moderating (Chart 3.2). This assumption is a challenging aspect because there is little evidence in the research literature about e-moderating associated with leadership. The argument for this is based on the assumption that leadership involves influence which is concerned with how leaders affect their followers. A parallel analogy is made with how the influence of e-moderators in their online roles and relationships affects members in an e-learning community, i.e. the followers, in online classrooms.

Chart 3.2 The distribution of the 7 Leadership Factors in Bass and Avolio (1993) Leadership Paradigm



It was important to the study to develop an argument for the significance of leadership qualities in online teaching because the *Pedagogical Variation* Model is based on both "a Transactional Leadership construct, namely task-giving" and Transformational Leadership construct, namely "motivational support/empowerment" (Bass and Avolio, 1989) as well as two other constructs based on e-learner online behaviours, namely e-moderator perceptions of e-learner collaborative capabilities and knowledge construction abilities. This Model is the contribution to knowledge arising from the PhD Investigation. The MAPD Study (Rogers, 2003/04) led to the conclusion, with a sample of e-moderators (n=30), using the multifactor e-leadership questionnaire(Appendices B2 and B3) that e-

moderating incorporated a significant degree of (i) inspirational motivation, (ii) intellectual stimulation (iii) Individual consideration and (iv) idealised (role-model) behaviour. The PhD study takes the 'leadership paradigm from an individual level (i.e. e-moderator competencies) into a higher level using leadership as a basis to underpin the hypothetical *Pedagogical Variation* Model (coined by Rogers, 2009) for online teaching.

Significant to the research investigation is Robin Mason's (1998:7) claim that:

"Excellence in tutoring online is fundamentally no different from excellence in other forms of teaching; enthusiasm and (student) involvement, intellectual perception and insight with the ability to model an understanding of the subject matter."

A connection with Mason's excellence in teaching can be made with transformational teaching styles, i.e. initiating enthusiastic empowerment (Bass & Avolio, 1994) within e-learning environments where an online tutor becomes an e-coach and facilitator, to model an understanding of the subject matter rather than, becoming solely a provider of tasks and subject-related materials that emerge as contextual targets for learning, characteristic of Bass and Avolio's (1994) transactional style.

While the ever-increasing use of virtual workplaces attracts research studies, there is little evidence of research investigating leadership in virtual groups. Early research, in this field of study, namely by Sosik (1997) and colleagues, Sosik, Avolio and Kahai (1997) and Sosik, Avolio, Kahai and Jung (1998), provided the first empirical data for leadership styles in virtual groups with sample populations consisting of undergraduate business students. This became of great interest to me because I could see a parallel situation with a group of online students and their online teacher in their virtual learning environment. The outcomes of their research gave me insight, firstly, on the effect of transformational and transactional leadership styles on a group's collective belief that it can be effective (i.e. potency) and secondly, on a group's creativity in performing tasks online.

Sosik, Avolio, Kahai and Jung (1998) argue that when undergraduate e-students were exposed to a transactional e-moderator (i.e. an online tutor that had been trained to act in a transactional, predominantly task-giving manner), the e-students worked with greater efficiency and level of productivity than those e-students who were exposed to a transformational e-moderator (i.e.an online tutor that had been trained to act in a

transformational, predominantly motivational supportive manner associated with the task-giving). Those e-students who were exposed to a transformational e-moderator showed greater effectiveness together with greater potency (self-belief that they were able to succeed as a group) which, arguably, explained why these e-students had enjoyed their learning experiences as a group and were eager to continue as a group to study further.

Subsequent research was conducted by Hoyt and Blascovich (2003) in a similar manner with comparable results. Those e-students that had an e-moderator trained to behave in a transactional manner were again more productive than those that had an e-moderator trained to behave in a transformational manner. However, these e-students, whilst being less productive, showed not only greater cohesiveness as a group, but also an increase in qualitative performance and leader satisfaction.

By reflecting on the above research outcomes, it became more evident that a leadership paradigm, related to transactional and transformational behaviours, is transferable to an online e-learning environment. Alongside this observation, the work of Russo and Benson (2006) which revealed how e-learner performance increased with the online visibility of e-peers and the online teacher, made a real impact on the research design. Swan (2002:159) concludes that the "immediacy" of teacher presence, in the face to face, traditional classroom correlates significantly with students' affective learning as well as their learning satisfaction. The findings from Russo and Benson's (2006) research in the virtual classroom match the same outcomes as those from the traditional classroom. This led to the consideration that, perhaps, online teacher immediacy reflects leadership qualities that underpin the role of an e-moderator in bringing about a learning environment by his/her online visibility in contrast to his/her invisibility, depending on e-learner preferences.

Chalmers (1993) concluded that classroom leadership was becoming essential to direct group behaviours to the attainment of common learning goals. These combined findings provoked the crucial question, whether transactional and transformational styles of leadership are generic to e-moderating? Chart 3.2 illustrates the original 7-factor leadership paradigm proposed by Bass and Avolio (1993). Based on these factors, Rogers (2004) created a Leadership-competency chart for pedagogical leadership online (Appendix B1).

Aspects of pedagogical leadership may also be considered with respect to monitoring online netiquette. Shirky (2003:1) concludes that an online group "can be its worst enemy". If an online group is left unmoderated, Shirky concludes that there will develop at some point or another a flame-war amongst the members of the group. Flaming is the practice of insulting, disrespecting or mocking another person's ideas (O'Sullivan and Flangin, 2003). Flaming is different from disagreeing with what someone says. It is fine to disagree with or critique someone's ideas for the advancement of knowledge, but it is important to do it politely in an ethical manner. It is unacceptable to use a discussion board to harass another student with unwanted attention of any kind (Herring, 1996; Mason, 1991). Any derogatory, offensive, or otherwise inappropriate comments are unacceptable and may result in removal of such postings, removal from membership in asynchronous discussion boards and other disciplinary action. At the same time, e-moderators may also need to deal with other unpleasant interactions in the e-learning online community. No swearing; no sexually graphic terms, no racial, ethnic, or religious slurs, no making fun of others based on their gender or sexual orientation becomes integrated into an online code of behaviour (Gurak, 2008). It is also considered that writing in all capital letters is equivalent to shouting or yelling (Bernthal, 1995) so e-moderators will seek to ask e-learners to state their views calmly and clearly. To help online learners in Australia understand online etiquette, the University of Wollongong (2005:10), New South Wales, gives the following advice : "Flaming, or flying off the handle and ranting at someone else is unacceptable; it is the equivalent of having a tantrum, something most of us wouldn't do in an onsite, face-to-face classroom..."

When flaming escalates into a heated online discussion or flame war, it is very offensive to other e-learners. If it does happen then the best practice is for e-learners to report it to their lecturer, tutor or subject co-ordinator (O'Sullivan and Flanagin, 2003).

E-peers need rules to understand netiquette and each member of the group is responsible for respecting each another. A competent e-moderator will have leadership skills to ensure that unacceptable online behaviours are checked. Amongst a plethora of guidelines, both Salmon (2000) and Berge (2001) urge the use of a constructivist approach by empowering e-learners to embody the role of e-moderator themselves whereby they are given opportunities to challenge systems, conferences and even conclusions. The following quote illustrates the e-moderator's opportunity to elicit student leadership, a highly

transformational competency, on the part of e-moderator skills. Berge (1995:6) concludes that "...it is perfectly reasonable to design elements of most on-line instruction so that students could take turns as assistant moderators and lead the discussion. This needs to be determined by the content of the class, and the skill and knowledge and attitude of the students...' This perspective led to the consideration of the way in which both design and delivery make an impact on learning spaces. It might be possible, through expert delivery to be a visible guide or through exceptional design to be an invisible sage. Instances may occur where experienced e-moderating practitioners may overcome difficulties where learning designs are found to be ineffective online.

As instructional designers Morgan and Belfer (2007:230) conclude that "in distance education, course development can be an individual or collaborative effort involving instructors, course authors and instructional designers." It is also contended that "there are a myriad of decisions to make when constructing online communication activities that support the tutor-student/student-student/student-content interactions. These include decisions around how the activity will be organized, the kind of facilitation that is needed and the type of assessment and feedback that will be provided." In a *Carpe Diem* 2-day workshop (Armellini and Aiyegbayo, 2010:932), e-moderators were given opportunities to design collaborative, multi-loop e-tivities, also with the use of wikis. It was found that e-tivities that made creative use of new collaborative technologies (e.g. wikis) in the learning design "generated high levels of participation among learners, especially when tutors applied effective e-moderating techniques and used the classroom setting to nurture the online exchanges (and vice versa)."

In a traditional face-to-face classroom the teacher can choose an instructivist approach or a constructivist approach, depending on the type of learning experiences to be developed (e.g. independent drill-and-practice skills, accumulating factual materials delivered by the tutor/ team-building skills, negotiation skills in problem-solving activities). In a virtual classroom, an e-moderator with leadership competencies in task-giving and motivational support together with e-moderating competencies (e.g. archiving, scaffolding, weaving, summarising, socialising) has opportunities to identify differing degrees of e-learner competencies (e.g. collaborative capabilities, knowledge-producing ability) and through personal e-mails an e-moderator is able to invite e-learners to their preferred learning environment (e.g. student-led, collaborative, interdependent constructivist environment/ self-directed, less collaborative, more independent learning environment/ a more teacher-

led learning environment with direct teaching/ facilitator-led, with a greater degree of empowerment and scaffolding).

The differentiation of e-learner learning preferences is important (Richter, 2012) because online teaching approaches can be matched from the spectrum of instructivist-constructivist pedagogical approaches. For example if an e-learner from Singapore prefers an instructivist learning environment, a mismatch with a constructivist learning environment might mean that the e-learner, feeling uncomfortable in a mismatched learning environment would withdraw and drop out. An example can be drawn from Richter (2011:75)

"Regarding the role and tasks of the instructor extreme differences were found between the German and the South Korean context. German students do not expect anything from their instructors but being experts in their fields and delivering a reasonable and well-prepared course. The South Korean students, in contrast, expected their instructors to build up a personal relationship and a situation of trust. They understand the instructors as an idol, a person who it is worth to follow. While German students do not see any trouble putting the instructor and his/her contents into question, this seems to be a no-go for the South-Korean students." This clearly indicates that a one-size fits all e-learning approach is inappropriate and unacceptable when considering the many differing educational and cultural backgrounds of online students.

A fundamental consideration in the study was *how* certain leadership qualities (Rogers, 2004) are accommodated in e-moderating, online roles and relationships. This was a challenging aspect because there was scant evidence in the research literature about e-moderating associated with leadership. The argument for this can be based on the assumption that leadership involves influence which is concerned with how leaders affect their followers. A parallel analogy can be pursued by identifying how the influence of e-moderators in their online roles affects the e-learning community, the followers, in online classrooms.

The research study was based on a hypothetico-deductive methodology (Popper 2002). Three hypothetical models were created and e-moderator perceptions of their online roles were elicited borrowing ideas from personal construct psychology. These perceptions were identified as twofold. i.e. e-moderator perceptions of (i) what they do online and (ii) what

their e-learners are able to do online. The data collected was then matched with the conceptual models using coding sheets in an effort to corroborate the models. An instrument was then designed to test the hypothetical models by falsification (Popper, 2002).

Different research methodologies were also examined to decide what research strategy would be best employed for the empirical study to collect data.

In summary, it was important to find out from e-moderating practitioners themselves, what it is that creates an effective learning environment. In addition the research attempts to illuminate how e-moderators perceive how they are best able to provide a learning environment conducive to sound learning outcomes. Vygotsky (1978) recognises that education must be holistic. It must be meaningful and allow for a person (the learner) to develop and grow in a social sense. The learner needs to see the greater purpose of what they are doing. In this way learning in one area will lead onto a greater understanding in another field. In other words, learning is interconnected. This suggests a conceptual model where a variation in pedagogical practices allows for the differing collaborative capabilities and knowledge construction abilities of online learners.

3.4 Summary

In this chapter the research rationale was discussed. There were characteristic features of virtual learning environments which researchers concluded were favourable for a constructivist learning environment associated with socio-cultural advantages. It was argued that in certain cultures an instructivist approach to teaching and learning is preferred The connectivity of ALNs afforded the communication channels essential for online collaboration.

However, a learning environment void of pedagogical leadership does not contribute to effective learning, especially if there are learners who need empowering to come online.

In the next chapter, Chapter Four, the theoretical background which influenced the research design is explored.

Chapter Four

What the Research Literature Reveals

4.0 Pedagogical Insights to Emerging Learning Technologies

The foregoing chapter outlined the way in which the research was conceived. It was the realization that all was not good in the work on a "one size fits all" approach by some previous researchers in the field of online learning and teaching that prompted the research to be undertaken.

In the tabulation below, Conole (2008) illustrates different pedagogical approaches associated with new learning technologies. The literature review highlights a number of pedagogical issues related to online learning and teaching to underpin the nature of on-going research in this area which is relevant to the study. Much of the research literature draws together a constructivist worldview as if this is the only pedagogical insight to be considered for online learning and teaching. "If one seriously adopts the constructivist approach, one discovers that many more of one's habitual ways of thinking have to be changed." (von Glasersfeld, 1995)

In search for evidence which relates technological innovation to differing pedagogical approaches, an examination of an Open University study by Conole (2008) was a good start. Table 4.1 indicates how behaviourism may underpin an instructivist approach where the online tutor transmits knowledge to e-learners, who in turn, learn the content to regurgitate for assessment and feedback with no collaborative knowledge construction amongst e-peers.

It is noted that constructivism is seen in two dimensions, namely individual cognitive constructivism and social constructivism as shown in the previous chapter (Chapter Three, Chart 3.1). With respect to situated learning theory and Fiedler's (1978) Contingency Leadership style, parallel insights can be drawn that provide a vital link for developing an inclusive pedagogical model for online learning and teaching. There is strong evidence that constructivism, whilst it appears to be the panacea for all online learning and teaching, as a 'one size fits all' approach, it does not, in fact, suit everyone and therefore marginalises and alienates those who are unable to participate effectively in a constructivist learning environment (Dirkx and Smith, 2004; Gulati,2004). The central point in the argument is

that potential e-learners, should be given opportunities to embrace the new learning technologies by an all-inclusive pedagogy which allows varying degrees of facilitator-led task-giving and motivational support together with the freedom for e-learners to share and exchange their own ideas for new knowledge creation.

Table 4.1 Different pedagogical approaches mapped to emerging technologies (Conole, 2008)

Theories	Main focus	Map to technologies
Behaviourism	Trial and error learning Learning through association and reinforcement	Presentation of content, use of multiple media to convey information Feedback through e-assessment tools Peer feedback
Cognitive Constructivism	Focus on the processes by which learners build their own mental structures when interacting with an environment Task-orientated, favour hands-on, self-directed activities orientated towards design and discovery	Guided and adaptive instruction through interactive materials Access to resources and expertise offers the potential to develop more engaging and student-centred, active and authentic learning environments
Social Constructivism	Emphasis on interpersonal relationships involving imitation and modelling and joint construction of knowledge	Multiple forms of asynchronous and synchronous communication offer the potential for more diverse and richer forms of dialogue and interaction between students and tutors and amongst peers Archive materials and resources provide ample opportunity for vicarious learning Different online communication tools and learning environments and social fora offer the potential for new forms of communities of practice or facilities to support and enhance existing communities
Situated learning	Learning as social participation Shift from a focus on the individual and information-focused learning to an emphasis on social learning and communication/ collaboration	Networking capabilities of the Web enable more diverse access to different forms of expertise and the potential for the development of different types of communities Online communication tools and learning environments offer the potential for new forms of communities of practice or can facilitate and enhance existing communities

In the following Section 4.1 a variety of pedagogical models are discussed which have a direct bearing on the conceptualisation of a new dimension in learning and teaching online.

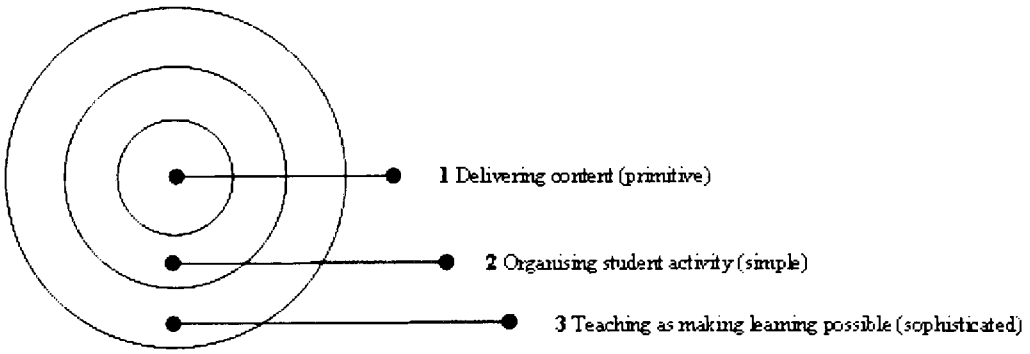
4.1 Pedagogical Models for Online Learning and Teaching: A choice?

In this section various models which have relevance to teaching and learning online are reviewed. These models helped to shape the research. Firstly, Ramsden's (1991) theoretical framework for teaching and learning in HE is a useful starting point.

4.1.1 Ramsden's (1991) Theoretical Framework of Teaching

In his theoretical framework, Ramsden incorporates three nested layers, each layer representing a theoretical perspective, i.e. Level 1 relates to his Theory 1; Level 2 relates to his Theory 2 and Level 3 relates to his Theory 3. Theory 2 includes the ways in which students are organised in a learning environment and Theory 3 relates to managing different learning approaches. These three levels are shown in Diagram 4.1 below. The first layer is underpinned by Ramsden's theoretical viewpoint which is comparable to behaviourism underpinning an instructivist pedagogical perspective as shown in Conolc's (2008) tabulation in Section 4.0. Ramsden's Theory I is characterised by the transmission of "a large accumulation of facts" (Kelly 1970: 2) underpinned by a rationale which "discourages different views and understandings, disregarding different contexts and experiences of individuals, and regards individuals as passive recipients of knowledge" (Gulati, 2004:1)

Figure 4.1 Ramsden (1991) Models of Teaching showing hierarchical relationship



What is useful to consider, here, is the way in which Ramsden has incorporated a nesting system of paradigms, as if it were to be reckoned that instructivism is the core basis on which other paradigms have been built, or more likely from which they have evolved. Researchers such as Shuell (1992), Crook (1994) and Koper (2003) disapprove of an instructivist approach, i.e. teaching as telling, due to the focus on transmission of content

and subject matter, with limited opportunity, if any, for the student voice to be heard. Invariably, this is still widespread in lecture theatres, as a pedagogical model in today's world of academia, stemming from traditional university settings. However, in today's diverse multicultural university environment with increasing student numbers and their demand for flexible learning, an instructivist approach becomes unacceptable and inadequate for the majority, but still a viable one for some (Sue and Kirk, 1972; Joo, 1999; Ziguras, 1999).

In the context of information communication technology of the early 1990s Ramsden (1991:114) concludes ironically, maybe with tongue-in-cheek, that there are "some more modern versions of his Theory 1 . . .(i.e.) the belief that the fundamental problems in university instruction adhere in the amount of information to be transmitted, and that these problems can be solved by technical fixes designed to transmit more of it faster."

Before moving to the second layer, Theory 2, there are researchers (Reiser and Dick, 1996; Roblyer, Edwards, & Havriluk, 1997) who advocate an instructivist approach as a practical teacher-centred means of teaching in a sequential manner with more individualised work. At the same time, these researchers argue that the focus is on clearly identifiable targets, with relevant activities and assessment in the attainment of goals and as such should not be ruled out as an unimportant feature in learning and teaching online.

The second layer of Ramsden's (1991) theoretical framework for learning and teaching, Theory 2 captures Ramsden's conceptualisation for pedagogical strategies in bringing students together to learn actively, by keeping students busy with activities. This student-centred activity is the basis of Theory 2 in comparison to Theory 1 where the focus is on passive learning where students are seen as receptacles for a one-way flow of knowledge from teacher to student in a teacher-centred learning environment. It is observed that this distinctive second level is not directly separated from the first, but encircles it.

Ramsden (1991:114) gives a cunning insight to his Theory 2 which evokes a sense of teachers pressurizing students into a habit of learning. He concludes that "teaching is seen as a supervision process involving the articulation of techniques designed to ensure that students learn." Ramsden notes that "activity in students is seen as the panacea." In his Theory 2 , which is about organising student activity, Ramsden identifies how "it is assumed that there are a finite set of rules which may be infallibly applied to enable them (students) to understand: these all imply that the students must learn *energetically*."

There is still, in Ramsden's Theory 2, an implication of a transmission model, where students are seen as individual learners in contrast to being a member of a 'learning group'. However, there is an important shift in identifying what the learner does, not what the teacher delivers, albeit there is a hint of supervisory guidance. This is a crucial insight because it can be recognise that whilst the conceptual framework for Theory 2 is supposed to be constructivist, there is still a *concealed* element of instructivism.

Gulati (2004:4) observes that despite acknowledging a constructivist world-view, in the design of interactive online courses, there are in many online modules "pre-defined learning structure and schedules which are reinforced through defined course syllabi, schedules and requirements for participation in online discussions. There is an assumption that collaboration in teacher-defined tasks and questions in online courses is learner-centred and flexible, because such courses provide learners with flexible access to online discourse and learning materials in their own time."

This happens in a number of other online teaching and learning instances, where constructivism is publicly ascertained but in fact the underlying features are more attuned to an instructivist approach. (Hughes and Daykin, 2002:218 ; Oliver and Shaw, 2003:58; Monteith and Smith, 2001:119)

The above insights regarding the instructivist – constructivist divide became, to a certain extent, a pivotal point in the research design for creating a different pedagogical rationale of 'openness' towards the creation of a conceptual model for *Pedagogical Variation* which encompasses constructivism alongside instructivism and self directed independent learning. More research for innovative conceptual frameworks for online learning would offer a means of widening access to higher education because the limitations of a 'one-size fits all' pedagogy (Jones, 2004) may contribute to reasons for students dropping out of online courses. There is a myth that constructivism is the panacea for effective e-learning for all kinds of e-learners (Dirkx and Smith, 2004: Roberts and McInnerney, 2007).

At Ramsden's level 3, Ramsden's Theory 3 describes both a collaborative learning and situated teaching approach (Conole, 2008). At this level of his theoretical framework, Ramsden (1991:114) sees teaching "as making learning possible...it is a process of working co-operatively with learners to help them change their understanding . . . it involves finding out about students' misunderstandings, intervening to change them and creating a context of learning which encourages students to actively engage with the subject matter." The nature of this approach is as much to do with the content of learning

as it is to do with the way in which it is being taught, with insight to learner difficulties. In this sense, Theory 3 reflects a situational approach to teaching and learning, where student needs direct the teaching process. In other words, a sound pedagogical model for online teaching and learning would take into account the *different* ways in which online teachers adapt their online teaching style in response to the *different* preferred learning behaviours of their online students.

Ramsden's Theory 3 suggest that there may be different approaches in the way in which student learning is to take place, not just one approach, i.e. single pedagogic practice, but more likely a multi-faceted approach to learning and teaching depending on the subject-matter and the student inclination to learning it. The researcher, by reflection-on-practice had already experienced this insight during her many years of teaching both in traditional and virtual classrooms. The question then arose as to where else in the research literature it might be possible to find further evidence to support this thinking. Examining Goodyear's (1999) pedagogical framework this multi-faceted approach could be recognised, in which he draws on four fundamental elements namely (i) philosophy (ii) high level pedagogy (iii) pedagogical strategy and (iv) pedagogical tactics. These are discussed in the next section

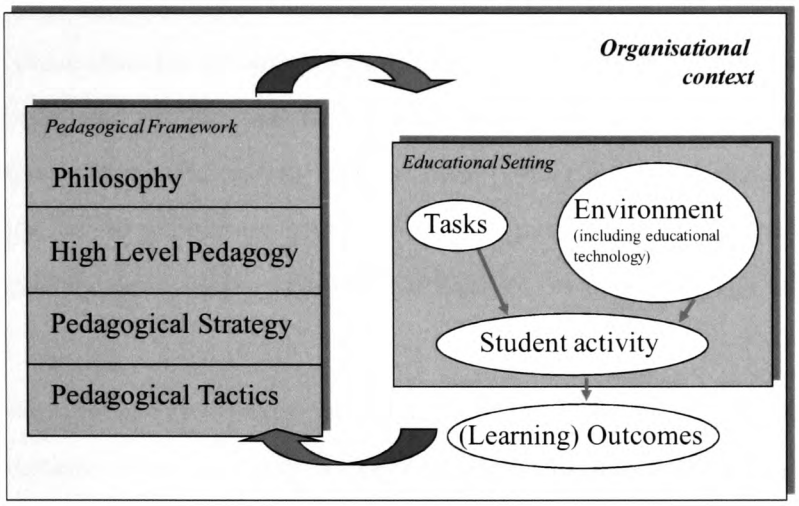
4.1.2 Goodyear's (1999) Pedagogical Framework

In his Pedagogical Framework, Goodyear (1999) concludes that sound practice in learning and teaching is underpinned by a philosophic rationale. For example Cunningham (1992) relates a relativist perspective to constructivist practice, whilst other researchers (Stone and Goodyear, 1995) view constructivism from a different philosophical standpoint, namely a realist standpoint.

Goodyear's (1999) diagrammatic representation of his pedagogical framework is useful because it shows how pedagogical practice is related to educational environments. Here there is a parallel with Ramsden's Theory-3, where Ramsden (1991:117) states that "the content to be taught, and students' problems with learning it, directs the method he or she uses", i.e. a particular pedagogy suits particular learner situations.

In his framework, Figure 4.2 below, Goodyear (1999) illustrates how tasks and environmental factors, including educational technology can enhance student learning.

Figure 4.2 Pedagogical framework, educational setting, organisational context (Goodyear,1999)



In this framework it is possible to envisage online learning in his conceptualisation of educational technology as a means of enhancing student learning. As in many traditional classrooms Goodyear (1999) uses a feedback loop where the teacher monitors all the learning outcomes and adopts 'pedagogical tactics' to increase a student's performance or the performance of a community of learners (Wenger, 1998). The model is useful because it brings into focus the necessary 'presence of a teacher' who is more than 'a guide on the side', by distinguishing *a high level pedagogical presence*; that is to say, the expertise of an experienced teacher, as a pedagogical leader, in contrast to a guide or map reader. Here again there are hints of instructivism within the theoretical framework which focuses on student-activities, as shown in the Figure 4.2 i.e. characteristic of a constructivist approach, supported by *teacher-led* task-giving and technology-based resources.

The way in which Goodyear (1999) separates pedagogical strategy from pedagogical tactics gave the researcher a greater awareness of how the notion of leadership might manifest itself in Goodyear's (1999) Model. That is to say that a strategy may be understood as a planned action which is carried out using tactics. This implies *leadership qualities* (Hersey and Blanchard, 1988; Kukulska-Hulme, 2004). Goodyear's interpretation of pedagogical strategy and pedagogical tactics became a useful guide for initial thinking on the possibility of introducing leadership as a basis for a new pedagogical model to support online teaching, not only because Goodyear conveys a sound basis for these notions but also exemplifies these in online learning, in particular. Goodyear (1999) suggests that e-moderators might

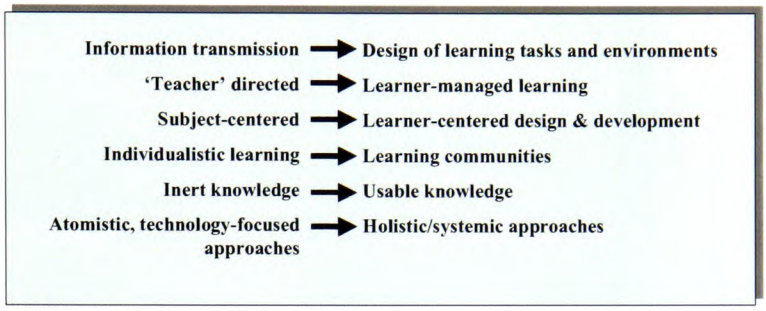
agree on the adoption of a particular strategy to encourage all e-learners to participate in the online learning environment. To do this a strategy might implement a number of tactics such as giving positive feedback for each e-learner contribution as well as giving examples of contributions that are of particular value to the task-in-hand. It is also suggested that another sound tactic would be to post intellectually stimulating questions which are non-threatening to an online group. As for 'lurkers', Goodyear advises that it is helpful to write private e-mails encouraging these students to come online. These pedagogical tactics of online tutors, as proposed by Goodyear (1999) can be clearly identified as motivational as well as providing intellectual stimulation (Bass and Avolio, 1989) in an effort to sustain the pedagogical strategy, i.e. to encourage everyone's participation. In other words, leadership qualities it is suggested, seem to be implicitly embedded in the pedagogy of tactics and strategy.

On the other hand Goodyear (1999) describes a contrasting strategy with alternative tactics. He illustrates a scenario where a team of e-moderators might consider that it is more valuable to develop a debate online involving higher order learning. Goodyear (1999: 25) suggests that different tactics would be used to encourage participation in this kind of task. For example, e-moderators might use "writing critical responses that challenge sloppy thinking or unsupported claims in a learner's contribution; exemplifying fine academic writing and argumentation; rewarding academic content rather than social contribution." Goodyear's exploratory research paved the way for developing a research design to accommodate the way online tutors might develop their pedagogical presence, using a variety of pedagogical approaches in separate groups of e-learners who show differing collaborative capabilities and knowledge construction abilities.

Depending then, on the underlying philosophic rationale, a different pedagogical approach may be chosen. For example, a typically instructivist, teacher-centred approach may be described from a realist standpoint as one where learners are given facts based on pre-existing knowledge to be learnt and assessed, in order to discover further what pre-exists (cf. Ramsden's Theory-1).

The difference from a relativist perspective is such that learners are given the freedom to construct their own meanings to their understanding through discourse with others, namely not only their teacher but also with their peers. Again, Goodyear (1999) captures well this dichotomy between instructivism (to the left hand side) and constructivism (to the right hand side) in his diagram below:

Figure 4.3 Paradigm shifts associated with the growth of constructivism and learner-centred approaches in educational contexts.



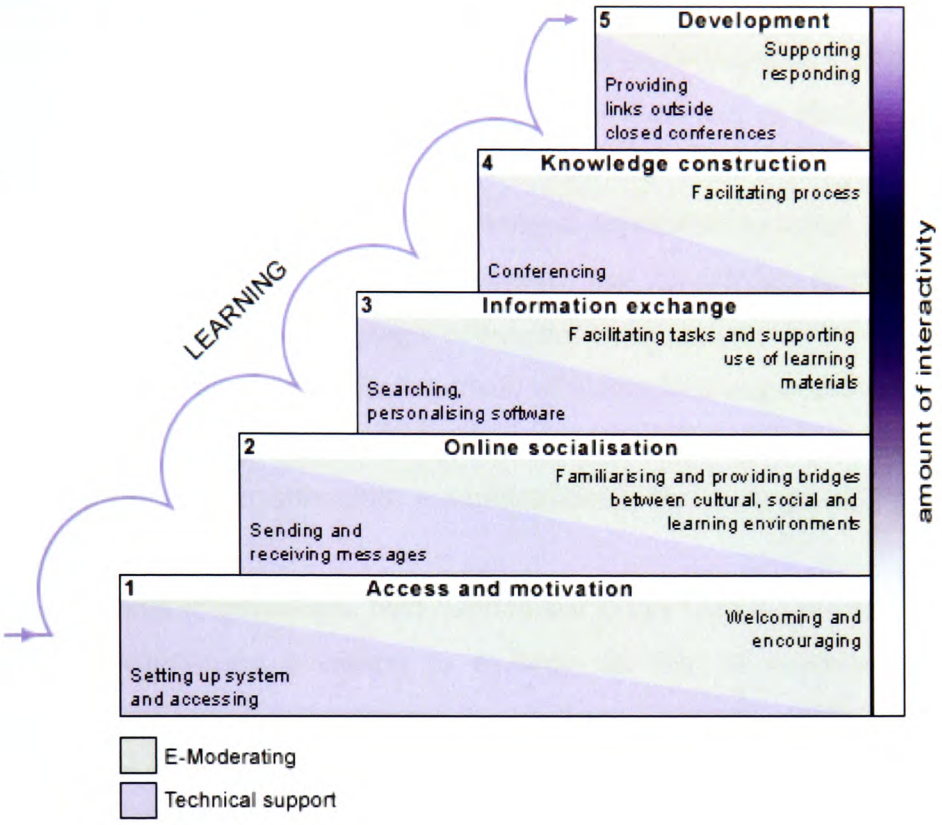
This diagrammatic representation gives insight to ways and means of developing a new pedagogical dimension for teaching and learning online because it lends itself to a variety of pedagogical tactics for innovative online e-moderating. A model proposed by Salmon (2011), given in the next section, it is noted, is based wholly on a constructivist paradigm.

4.1.3 Salmon's (2011) Five-Stage Model

As an example of a competency-based model for online e-moderating, Salmon's five-stage model is illustrated in Figure 4.4 showing a flight of steps, where each step requires e-learners and e-moderators to collaborate progressively in computer-mediated-conferencing (CMC) learning communities from Stage 1 to Stage 5. Each stage is described to show how a participant moves from one stage to the next.

- (Stage 1) *freedom to access and motivation* to
- (Stage 2) *on-line socialization* to
- (Stage 3) *information exchange* to
- (Stage 4) *knowledge construction* and finally achieve
- (final Stage 5) a *developmental approach*

Figure 4.4 A Five-Stage Model for online teaching and learning (Salmon, 2011:32)



In each of the five stages, there emerge significant e-moderating competencies. (Appendix A1, Chart illustrating competencies for online teaching).These e-pedagogical competencies are mirrored by a number of researchers in one way or another. For example (Berge, 2001) emphasises competences for the creation and maintenance of promoting human relationships, developing group cohesiveness, maintaining the group as a unit and in other ways helping members to work together in a mutual cause. Similarly (Salmon, 2011:35) adheres to similar approaches in creating a welcome atmosphere, motivating e-learners and helping participants to develop their own on-line identity. This may be seen akin to transformational leadership, nurturing and empowering learners (Rogers 2004) to actively team-up in the spirit of an adventure, collaborating in a learner-centred approach in contrast to teacher-centred, transactional management of learning, i.e. instructivist.

According to Jones and Peachey (2005) few postings were made at the stage of socialisation (Stage 2). These researchers concluded that face-to-face communication at an initial stage should be introduced to develop socialisation and that by doing this, Jones and Peachey suggest that Stage 2 may be omitted.

At Stage 3 of Salmon's five-stage model, transformational e-competencies (Rogers, 2004) of e-moderators emerge, such as providing a variety of conferences to suit different student needs, dealing promptly with difficulties among participants, such as dominance, harassment and perhaps excessive lurking (non-contributors), as well as transactional e-competencies e.g. offering tips for dealing with excessive information overload, setting up useful e-tivities (Salmon, 2005) and tasks, especially those not so easily or productively undertaken off-line.

Berge (2001) analyses comparable transformational approaches to create the infrastructure for successful e-moderating where he suggests that knowledge construction is best achieved by e-moderators maintaining a non-authoritarian, constructivist style to avoid the authority role (i.e. transactional characteristic of hierarchical organizations). Both Berge and Salmon identify the pedagogical significance of finding unifying threads by weaving several strands of conversation into a summarization that may prompt participants to pursue the topic further.

Amongst a plethora of guidelines, both Salmon and Berge urge the use of a constructivist approach by empowering e-learners to embody the role of e-moderator themselves whereby they are given opportunities to challenge systems, conferences and even conclusions. The following quote illustrates the e-moderator's opportunity to elicit student leadership, a highly transformational competency, on the part of e-moderator skills. Berge (1995:6) concludes that "...it is perfectly reasonable to design elements of most on-line instruction so that students could take turns as assistant moderators and lead the discussion. This needs to be determined by the content of the class, and the skill and knowledge and attitude of the students...'

Laurillard (2002:151) exemplifies how new possibilities can arise by "growing in the excitement of creativity with the intention of doing something new."

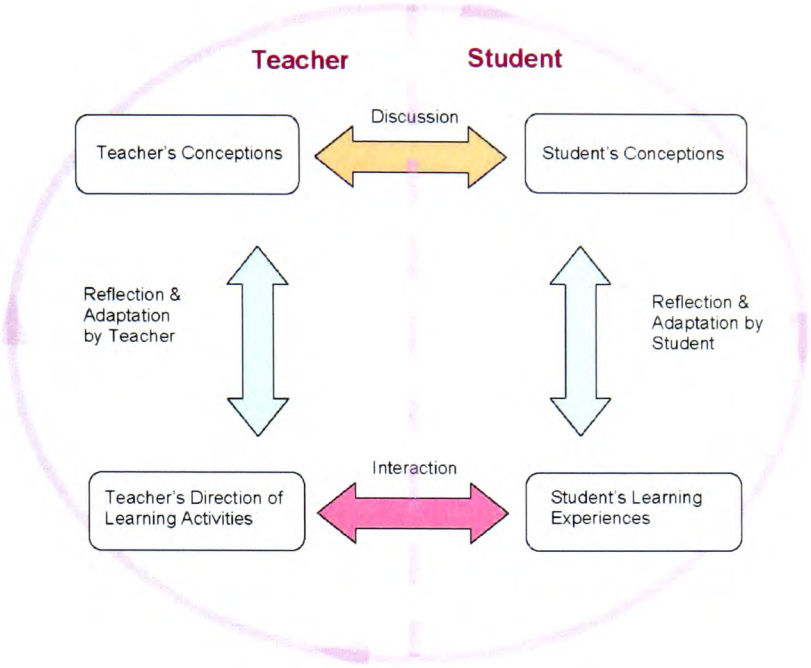
In the next section, Laurillard's (2002) Conversational Model is discussed in which a new teaching paradigm is visualised by separating what a teacher does and what students do. .Laurillard focuses on a so-called Conversational Model for dialogical participation of online tutor with e-learners and e-learners amongst themselves, which differs significantly from the one-way transmission model presented in Ramsden's Theory 1.

4.1.4 'Conversational Framework' Model for Teaching (Laurillard, 2002)

Laurillard's (2002) Model is powerful, not only because she configured it on Pask's Conversation Theory (1995) but also owing to her exploration of cybernetic communication networks. Laurillard's model is designed using insights which determine the appropriateness

of learning technologies including online systems. A diagrammatic representation of Laurillard's early work is given below in Figure 4.5.

Figure 4.5 Outline of Laurillard's 2002 Conversational Model for online Learning



Laurillard visualises the conversational interaction between e-learner and e-teacher as a vital component for online teaching and learning. Pask (1976:130) introduced a conversational system, distinguishing between holist and serialist behaviours. The holist has "many goals and working topics, under his aim topic" and the serialist has "one goal and working topic, which may be the aim topic." Research evidence indicates that holists "tend to discover a global description of topics, or to invent a description compatible with the conversational domain, while serialists only describe the topic for which they are constructing an explanatory model" (Pask, 1976:130). Depending on the type of learning behaviour distinct teaching strategies can be matched to a particular teaching strategy. Pask (1976:132) concludes that in the matched condition a "student will learn more quickly and retain the information for longer. Conversely a mismatched condition leads to grossly inferior performance and a pronounced failure to comprehend the principles underlying the subject matter." Laurillard's (2002) Conversational Model identifies the importance of discussion and interaction, together with two other processes, namely adaptation and reflection. By entering the learner's world the teacher can adapt to a student's ways of learning.

In this model, it is clear that tutor presence remains as an important starting point with subject expertise and know-how, but there is a distinct difference from the instructivist, one-way transmission model. There is a dialogical conversation between e-learner and online teacher, that is to say a two-way communication where the teacher-speak reflects on the student's understanding before giving another task. This reflective process brings into focus the internalisation of a personally meaningful experience (Schön, 1987) in a socially constructivist (Conole, 2008) online learning environment. Laurillard (1994:21) warns that "if a tutor gives little time for reflection, they fail in providing the opportunity for the learner to construct new meaning in relation to the existing meanings, leaving the learning process incomplete."

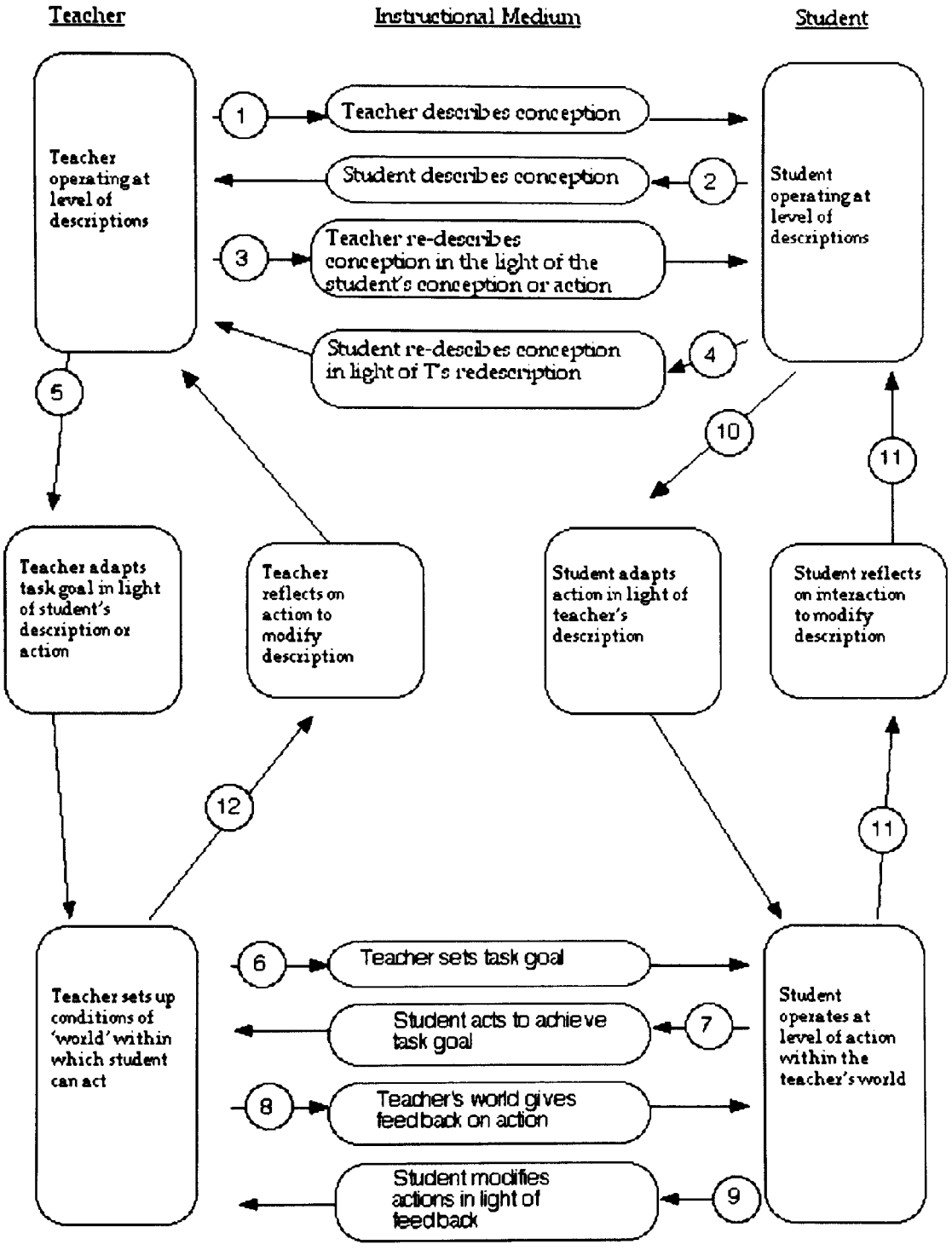
Another detailed representation, Figure 4.6, of Laurillard's (2002) 'conversational framework' model brings to light the interactivity between a teacher and a student, in twelve stages, through an instructional medium, including online teaching and learning. In the initial stage (stage 1) the teacher describes a conception, which is then described by the student (stage 2). In response, the teacher reflects on the student understanding and re-describes the concept (stage 3). In the following stage (stage 4) the student is given the opportunity to reflect on the teacher's feedback and re-describes the concept. From these four interactive stages the teacher adapts a task-goal for the student (stage 5), setting up an environment for an activity (stage 6).

As the student operates in the teaching frame (stage 7) the teacher provides *feedback* (stage 8) and the student in response modifies his/her action reflecting on the teacher's feedback (stage 9). This is followed by the teacher giving the student the opportunity to describe their activity (stage 10) which (description) can then be *modified* in the light of the teacher's feedback (stage 11). When the teacher has had a chance to reflect on the student's activity (stage 12) the cycle for learning and teaching begins again. This, clearly illustrates a re-iterative frame of dialogue between the student and the teacher.

Within these twelve stages, teacher-direction is geared on student understanding and student responses to reach specific teacher-oriented goals, illustrated in Figure 4.6 below.

A similar reflection is given by Bruer (1993:32) who concludes that "teaching is an ill-defined problem where every student – teacher interaction can change the teacher's goals and choice of operations". This conceptualisation of teaching is similar to Ramsden's (1991:117) described in Section 4.1.1 above.

Figure 4.6: The Twelve stages in Laurillard's 'Conversational Framework' Model



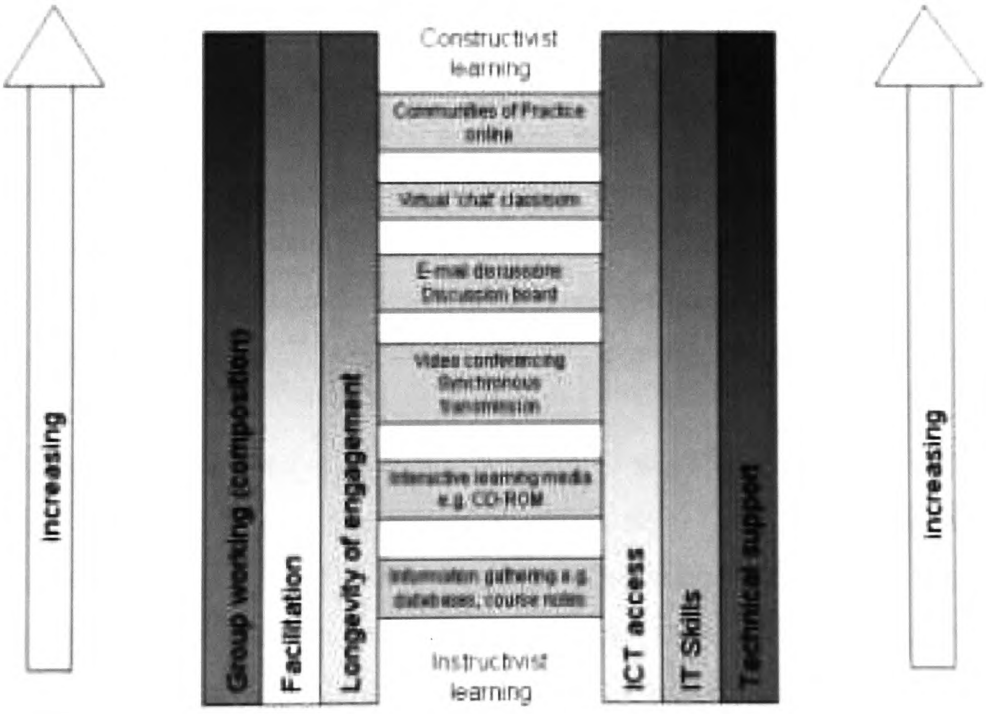
Another type of conceptualisation for online learning with respect to the development of the application of new technologies within educational contexts can be found in Moule's (2007) Ladderwise Model.

4.1.5 A Ladderwise Model (Moule, 2007)

Moule's conceptual ladderwise model (2007:39) challenged Salmon's original stepwise model (2000/2011) on the grounds that "Salmon's (2003) model is dominating a discourse in learning technologies being seen as a template for the design of all online teaching and learning environments regardless of the context." Moule (2007) refers to the difficulties Lisewski and Joyce (2003) encountered in adopting the five-stage model because it failed to take into account individual differences" (2007:39) and objections were raised that the 'one-size fits all' approach was inadequate.

Moule (2007) sees the progression in learning with computerized media essentially passing from a teacher-centred, instructivist pedagogy to student-centred constructivist pedagogy. The rungs of the ladder depict the different types of electronic media available from using electronic databases and electronic course materials, and CD-ROMs assuming an instructivist approach to using video-conferencing, emails and online interactive discussion boards, assuming a constructivist approach.

Figure 4.7 Moule's conceptual model of online learning, the e-learning ladder (2007:41)



It is suggested that it would not be necessary to engage in the rungs progressively from the bottom to the top rung, but to use the model more as a means of identifying the different types of learning technology tools available. The researcher might question as to whether an instructivist approach might not also be possible in an online discussion forum that is predominantly teacher-led, with little e-learner autonomy and little room for shared ideas and knowledge building amongst the e-peers, in contrast to a constructivist approach. In her Conceptual Framework, Moule (2007) suggests that learners might begin to use computerised media in a teacher-centred instructivist environment (i.e. at the lowest rung, non-interactive information gathering) through four other stages before being able to cope technically with a constructivist learning environment (i.e. the top most rung, interactive, collaborative learning in a community of practice).

The acceptability of a paradigm shift from instructivist to constructivist approaches much depends on how e-learners and e-moderators regard the need to change the way they think about the learning/teaching processes online. With increasingly rapid technological changes and improvements in CMC environments it is possible to access vast stores of information necessitating vital questions to be asked by e-moderators when framing e-learning tasks. What will students be doing with this vast store of information? Will they be able to classify, analyse, predict and create new worlds or will they get lost in the oceans of information? (French, 1999)

Brooks and Brooks (1995) present a useful comparison of instructivist and constructivist approaches. In the instructivist approach, transactional style (Rogers 2004) the e-moderator writes the objectives whilst in the constructivist approach, there is less of a transactional style (Rogers, 2004) because e-learners are encouraged to work collaboratively writing their own objectives, dependent upon their own interests. In the former approach, objectives are written for all in hierarchical form and sequenced from simple to complex, whilst the latter stresses the importance of divergence based on the uniqueness of the learner, (i.e. e-learner oriented).

In addition, the instructivist approach accepts passive learners as holes to be filled with static data whilst in the constructivist approach problems are solved that have personal relevance to the learners. What is critical also is that knowledge is separate from knowing in the instructivist approach whilst the opposite is the case from the constructivist approach; i.e. knowledge is individual and socially constructed, based on personal experience. Finally, from the instructivist perspective, learning consists of acquiring truth or the ability to mimic and can be measured with tests, whilst the approach where learning

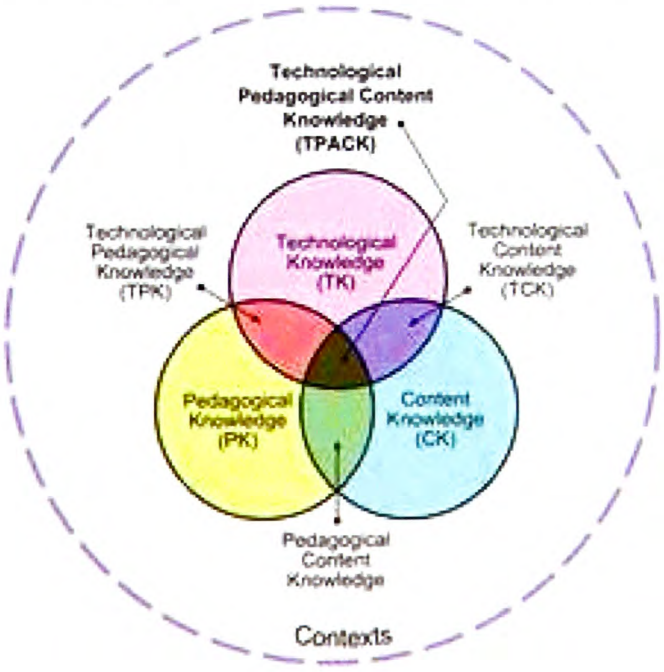
can only be measured through direct observation and dialogue is akin to constructivist theory. These issues underpin deep-rooted pedagogical paradoxes and are critical in the understanding of the complex nature of teaching and learning online.

4.1.6 Conceptualising 'Technological Pedagogical Content Knowledge' Koehler and Mishra (2009)

A more recent approach to online learning and teaching is given by Koehler and Mishra (2009). In their development of bringing together (i) technological knowledge (ii) pedagogical knowledge and (iii) content knowledge within educational contexts, their model uses the conceptualization of a Venn Diagram where the three circles for technological knowledge (TK), pedagogical knowledge (PK) and content knowledge (CK) overlap to give four further 'mappings', namely (iv) technological pedagogical knowledge (v) pedagogical content knowledge (vi) technological content knowledge and finally (viii) technological pedagogical content knowledge.

Koehler and Mishra's (2009) conceptual framework brings together important aspects for online teaching which avoid the assumption that online learning is technology-driven. Yet it highlights the significance of the combination of technological knowledge with both pedagogical knowledge and content knowledge. In other words, an online teacher with pedagogical knowledge and content knowledge becomes more effective online with technological know-how.

Figure 4.8: Innovative learning promoted by the combination of technological knowledge, pedagogical knowledge and content knowledge (Koehler and Mishra, 2009)

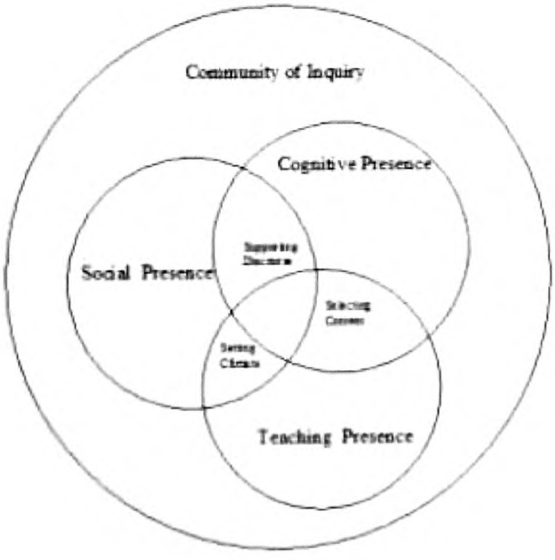


Many paradoxical claims were being made on the effectiveness or otherwise of e-moderator strategies in asynchronous virtual classrooms. This critical review of the research literature focuses on those investigations that have enabled me to gain greater insight to pedagogical issues emerging from this kind of learning environment. In the early stages of my exploration of the many research studies about online learning, much was written about the technical infrastructure and hardware and software platforms which support computer-mediated-conferencing. Whilst this made interesting reading, these are not included in the literature review because my main focus was on gaining insight on how researchers were tackling the emerging pedagogical issues for online learning and teaching, including the problematic absence of physical presence or absence of body in the virtual classroom. This factor alone presents a challenge for online teachers because there are no visible non-verbal cues like body-language, facial expressions, eye-contact or noisy rapport e.g. laughter, sighing, foot-tapping or scuffling which teachers encounter in traditional classrooms, with the physical presence of their students. In my experience, these non-verbal cues play a significant part in helping the teacher and like-wise the students recognise the general climate of understanding, whether good, bad or indifferent. So how does this affect learning and teaching on-line? This is a question, amongst others that I was interested to follow up because, in my mind, it has implications regarding what kind of pedagogical presence works online and what does not.

4.1.7 Establishing a Community of Inquiry: Garrison, Anderson, Rourke and Archer (2000)

Garrison, Anderson, Rourke and Archer (2002) conclude that an effective model for online learning requires three specific orientations, namely: a social presence, a cognitive presence and a teaching presence, as illustrated below in Figure 4.9.

Figure 4.9 Community of Inquiry for online Teaching and Learning



The interaction of all three orientations is seen to be pertinent to effective online learning and teaching in a community of e-learners. Teaching presence is regarded as a necessary element in online learning. It is defined by Garrison and colleagues (2002:68) as "the design, facilitation, and direction of cognitive and social processes for the realization of personally meaningful and educationally worthwhile learning outcomes". This model is extremely useful because not only does it reflect on an individual cognitive nature of learning but also brings into focus the social aspects of effective learning and teaching, because an important factor in teaching presence is to facilitate discourse, and to maintain the momentum of learner engagement. Garrison and colleagues describe discourse facilitation as "focused and sustained deliberation that marks learning in a community of inquiry". This seems to indicate the necessity for online teachers to provide motivational support and intellectual stimulation (i.e. transformational leadership qualities) as well as tasks, (i.e. transactional leadership quality) within a social pedagogical framework, discussed in the next section, Section 4.1.8.

Garrison and Anderson (2003:3) conclude that "the essential feature of e-learning extends beyond its access to information and builds on its communicative and interactive features. The goal of quality e-learning is to blend diversity and cohesiveness into a dynamic and intellectually challenging 'learning ecology'. Boston et al. (2010) explored the indicators underpinning the notion of Communities of Enquiry (Garrison and Anderson, 2003) relating to the three aspects of cognitive, social and teaching presence, in order to identify those factors that affect e-learner retention and persistence in online learning. These

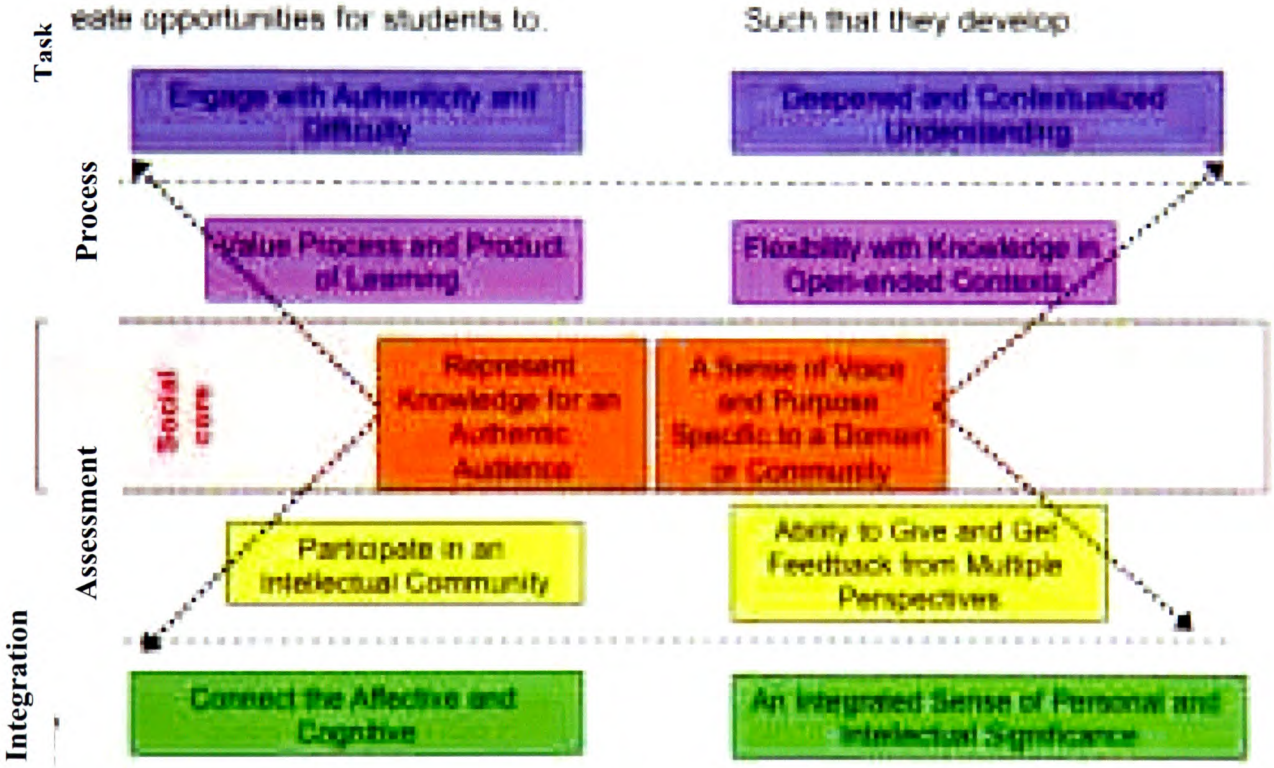
researchers had recognised that learners could become independent in terms of time and space which meant "a corresponding loss in collaboration and increased isolation. Independence and collaboration seemed contradictions. More of one inherently meant the loss of the other. The transformational power of e-learning goes to the heart of this issue." (Garrison and Anderson, 2003:3). The role of social pedagogy is discussed in the following section.

4.1.8 The Emergence of Social Pedagogy: Bass and Elmendorf (2009)

As proponents in social pedagogy, Bass and Elmendorf (2009) conclude that online learning and teaching becomes most effective when driven by socialisation. In their conceptual framework the e-learners are given opportunities to explore freely within their intellectual community. Here there are echoes of Garrison and Archer's cognitive presence. At the same time both e-learners and online teacher(s) are in dialogue with one

another. Here there are echoes of Laurillard's 'conversational' model Again there is the representation of what a teacher does to influence what a student does to reach goals for learning. This strikes me as a model where there are implicit elements of leadership. In this social pedagogical framework there are opportunities for e-learners to develop their own individual voice within a community of learners. When I reflect on this particular model, there are a number of good clues which underpin effective online collaboration, such as 'to give and get feedback' from both online teacher(s) and e-peers.

Figure 4.10 Social pedagogies: design elements and goals (Bass and Elmendorf, 2009)



The four components, i.e. (i) Task (ii) Process (iii) assessment and (iv) integration of cognitive and affective learning support, contribute explicitly to the conceptual framework as a whole, which demonstrates a holistic approach to online learning and teaching.

4.1.9 A Social Pedagogical Model

Another Social Pedagogical Model uses a simple flower schematic design (Diagram 4.11) to show how social pedagogy is construed between students' experiences and teaching

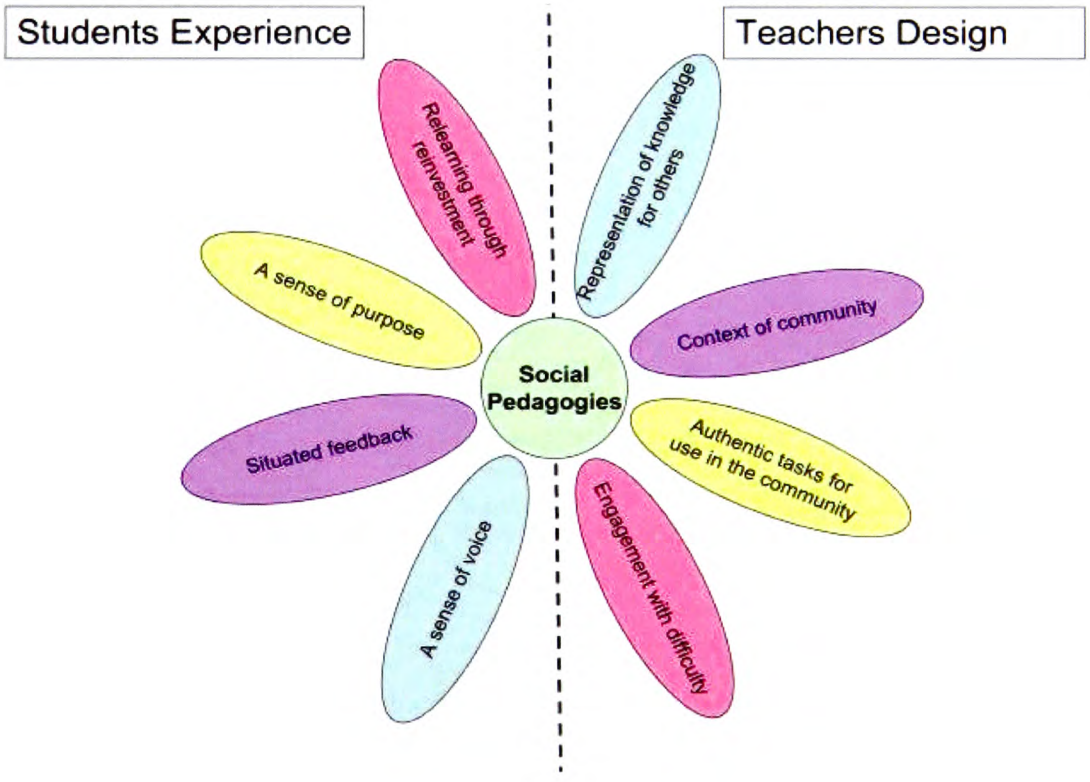
principles adopted in a pedagogical design for learning. This imaginative representation, however simple, clearly identifies what students and teacher(s) contribute to the learning 'platform'. What it does not do is to show how the students' experiences and the teaching design principle integrate with each other.

Figure 4.11 below shows the students' experience and the teacher's design for learning. The separation of students on the left and teachers on the right is a similar representation as Laurillard's (2002) 'Conversational Framework' Model (Figure 4.5).

There is a distinction. In Laurillard's model there is a two-way interaction. In the social pedagogical model below the four petals representing the student experience play a vital role in mapping out (i) relearning through reinvestment (ii) a sense of purpose (iii) situated feedback and (iv) a sense of voice.

From the teacher perspective, the four petals are concerned with the teacher's design for learning. These are shown as (i) representation of knowledge for others (ii) context of community (iii) authentic tasks for use in the community and (iv) engagement with difficulty. This model for social pedagogies does not show how the eight perspectives integrate with each other. This is a limitation.

Figure 4.11 Elements of a Social Pedagogical Model for learning and teaching



The social pedagogical models emphasise the significance of socialising in developing online learning communities. It is clear from these models that online learners are offered

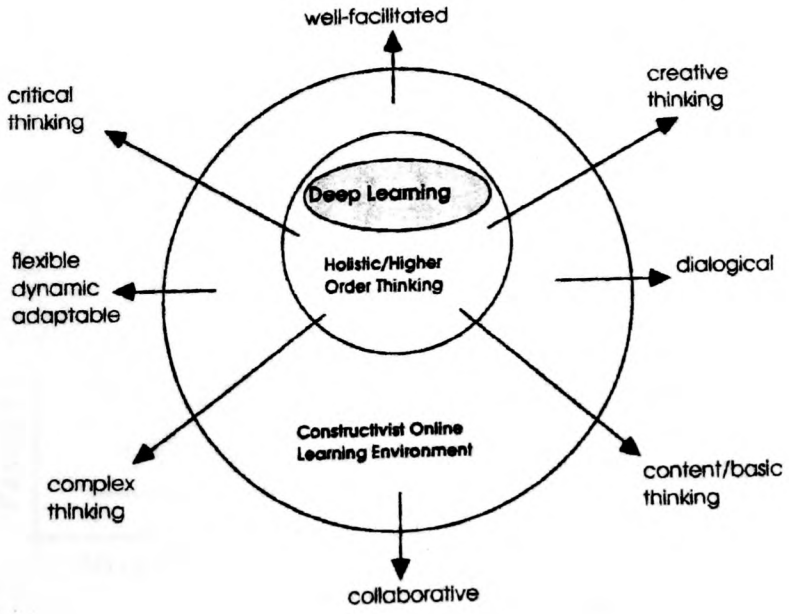
the freedom to explore alternative ways of creating new perspectives in their studies. This calls for new thinking about creating virtual learning spaces, accessible to everyone.

4.1.10 An Integrate Online Learning Environment: Morrison (2007)

In our knowledge-based economy, Morrison (2007:105) urges the need for a 'new pedagogy' with which institutions of higher education can successfully employ technology-enhanced learning initiatives. It is imperative, according to Morrison (2007:106) that "institutions of Higher Education" have critical responsibilities to provide learning environments conducive to the development of capable and creative minds...They must empower learners to know how to pursue and capture broad and deep meanings and to use holistic thinking as the conduit to deep learning."

Morrison's (2007) 'new pedagogy' means a radical shift from a transmission model of teaching with the emphasis on memorizing and simple recall of facts, i.e. what might be called a surface or "shallow" approach to learning. It is argued that such a passive learning approach inhibits "deep" learning that takes place through the development of holistic thinking skills i.e. critical, creative and complex thinking at both an individual level and a social one. Figure 4.12 below illustrates a conceptual map of correlated factors important to the construction of an e-learning environment (Morrison, 2007:109).

Figure 4.12 Example of an integrated online learning environment (Morrison 2007: 109)

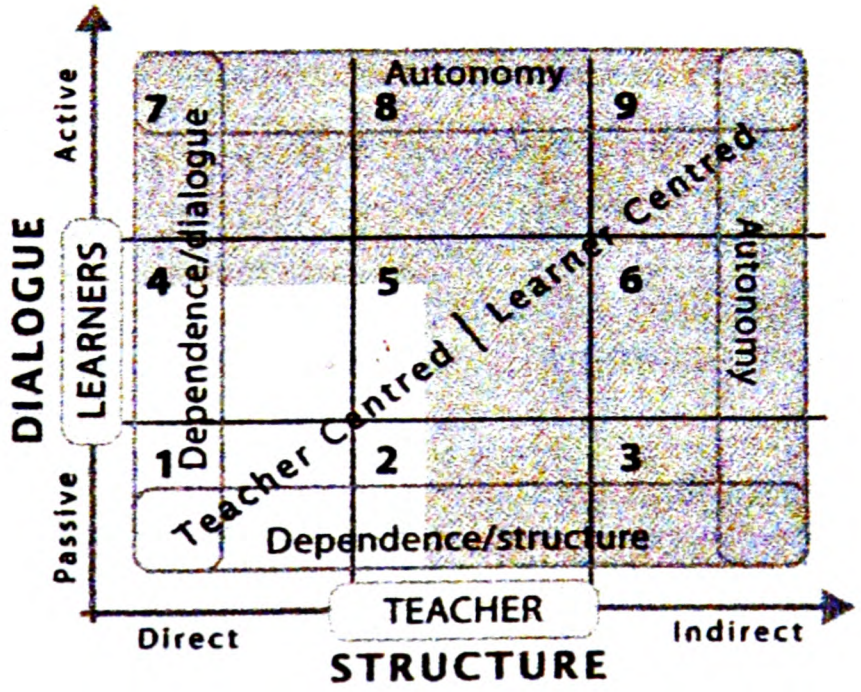


This conceptual map incorporates 'deep learning' as the core of an integrated learning environment. This means "adopting and implementing technology within dynamic and adaptive learning environments specifically designed to address and support higher-order learning outcomes, and not just using them as a glossy, high-tech overlay to an outdated and ineffective pedagogy" (Morrison, 2007:115). The online learning environment is here seen as a constructivist and collaborative one, allowing for dialogue and exchange of views and as such promotes and is promoted by holistic, critical thinking.

4.1.11 Framework for Instructional Designers: Morgan and Belfer (2007)

In their framework for planning communication activities, as instructional designers, Morgan and Belfer (2007) developed a pedagogical tool based on Saba's (2003) interpretation of the structure and dialogue components of Moore's (1973) Transactional Distance Theory. The horizontal component describes the teaching style varying from 'direct' to 'indirect' and the vertical component describes the learning style varying from 'passive' to 'active'. This framework is illustrated in Figure 4.13 below.

Figure 4.13 Prior Educational Experiences of a Group of Learners (Morgan and Belfer (2007)



This framework shows the relationship between learner preferences for learning and teacher preferences for teaching. It provides a visual representation of the way in which the differing components in a learning environment are inter-related. The left lower side represents teacher-centred approaches "with which the instructor has direct control of the structure and students are passively receiving information" (Morgan and Belfer, 2007:235). The upper right side, in contrast, represents "the learner-centred approach for which the instructor has indirect control of the structure" (Morgan and Belfer, 2007:236).

The third component of Moore's (1973) Transactional Distance Theory, autonomy, is also captured in the framework. The learner-centred quadrants show a greater autonomy for self-directed learning than the teacher-centred quadrants, where students are seen to be dependent on the course structure and teacher dialogue. Morgan and Belfer (2007:239) found that the framework "helps to remind instructors what the key elements of the learning process are and helps them focus on the elements that are most important." This framework illustrates how the two variables, teacher presence and learner presence, are related in differing teaching and learning environments. The researchers Morgan and Belfer (2007:240) recognise that any instructional design is "only as good as the learning community that implements it and makes it work."

To have access to this research has proved to be invaluable in shaping the research design of the current study. The next section gives an overview of pedagogical issues that give useful insights to diverse pedagogical approaches in contrast to 'a one-size fits all' approach.

4.2. Pedagogical Themes emerging from the Research Literature

Several themes emerge in the research literature about online pedagogy, which is central to the research design.

In this section a number of themes are briefly explored, which emerge from the research literature. These themes have guided the shaping of the research design, to fill a gap for bringing effective e-learning to all potential online students from differing cultural and educational backgrounds i.e. having a range of knowledge construction abilities and collaborative capabilities, in some cases stronger than others and in other circumstances weaker than others.

A concise list of research evidence about online teaching that appears to be prevalent in this field, in addition to many tips and guidelines given by numerous practitioners is shown in Table 4.2 below.

Table 4.2 Pedagogical factors that emerge in online Asynchronous Discussion Forums

Item	Pedagogical factor	Author(s)	Date
1	Interactive peer-group collaborations - articulation, justification & negotiation	Crook	1994
2	Shared responsibilities	Laurillard Goodyear, Garrison, Anderson and Archer Bass and Elmendorf	1997 2001 2002 2009
3	Scaffolding	Salmon Vygotsky	2000 1978
4	Setting hypotheses	Valdez *et al.* Koehler and Mishra	2000 2009
5	Reflection	Schön Laurillard Goodyear Berge	1992 1997 2002 1995
6	Knowledge activation and knowledge application	Gagne Bruner Goodyear	1965 1997a,b 1999
7	Individualized learning and motivation	Goodyear Garcia & Pintrich Garcia	2002 1991,1993 1994, 1995
8	Goal setting	Schön Laurillard Goodyear Gagne Ramsden	1992 1993, 1997 2001 1977 1999
9	positive attitude	Mehanna	2002, 2004
10	Disposition	Gagne Garcia & Pintrich	1977 1991
11	feedback and reflections	Schön Laurillard Moule	1992 1997 2007

4.2.1 Interactive peer-group Collaboration and Participation: Articulation, Justification and Negotiation

Hrastinski, (2008) concludes that participation in online learning is paramount to effective online teaching and learning. This is a complex process assuming that e-peers will come online, interact with each other to share their ideas and solve problems together (Crook, 1994). The socialisation of e-peers in the creation of knowledge is seen to shift a learning paradigm from the individual to a group (Jonassen and Land, 2000). Meanings are negotiated and justified in a constructivist environment, where "there is no correct meaning of the world that we are striving to understand. Instead . . . there are many ways to structure the world and there are many meanings and perspectives for any event or concept" (Hrastinski, 2008:5). I would argue that this may be so when e-peers are able to interact with one another and have the capability to collaborate. On the other hand if e-learners have problems in negotiating meaning with their e-peers, due to all kinds of reasons e.g. cultural differences, language and shyness, then a constructivist environment will not encourage such e-learners to participate and they may end up as 'lurkers'. There is a gap in the literature about how to redress this.

Wenger (1998:267) raises three questions that have guided my visualisation for a new online pedagogy:

1) *How can we minimize teaching to maximise learning?*
2) *What kind of rhythm and shifts of focus will allow learning and teaching to inform each other?*
3) *How can we maximize the process of negotiation of meaning enabled by that interaction?*

The first question resonates well with my conceptualisation of an online teaching model where I would minimize learning tasks for students who are struggling to understand unfamiliar concepts, encouraging online learners to take time to reflect and exchange their their own ideas. Considering the second question, the way in which a hypothetical framework for *Pedagogical Variation* could demonstrate *"rhythm and shifts of focus"* would be to develop e-moderator online strategies where the online teaching style becomes adaptable to learner online behaviours. Thirdly, to *"maximise the process of negotiation of meaning"*, the hypothetical framework for *Pedagogical Variation* should allow for a delicate balance in e-moderator task-giving, transactional behaviour and motivational support, transformational behaviour. That is to say, pedagogical leadership, e-moderator presence online, would be conducted through varying degrees of visibility (Wozniak,

2007). Where online peers collaborate actively in knowledge creation, e-moderator visibility would be less than in those situations where e-moderator visibility would increase (Chapter 2, Section 2.6, Figure 2.1). For example, more task-giving and increased motivational support would be employed, maximising negotiation of meaning, thereby, encouraging and bringing lurkers online to participate in a learning community. In contrast, self-directed and independent learners may prefer to negotiate meaningful exchanges with an e-moderator rather than with e-peers.

Vonderwell and Zachariah, (2005:32) define participation as "taking part and joining in a dialogue for engaged and active learning. Participation is more than the total number of student postings in a discussion forum."

4.2.2 Shared Responsibilities: Division of Labour

Dewey's (1916: 160) inquiry-based philosophy of education conceptualised the learning process as a "shared activity in which the teacher is a learner and the learner, without knowing it, a teacher." Laurillard (1997) concludes that in online learning there is a shared responsibility. The online teacher takes into account how e-learners reflect on and communicate their experiences so as to be able to provide appropriate tasks. It becomes a two-way dialogue.

Pallof and Pratt (1999:56) notice that "regardless of the means, by which group management is attempted, issues related to group dynamics and the potential for unequal participation must be considered." Palloff and Pratt suggest a division of labour by creating smaller online groups of e-learners who appoint a team leader. "That person then becomes responsible for facilitating the interaction within the team, with the understanding that help can be requested" (p.56) from the e-moderator. The group can then self-select different team leaders and in this way everyone gets a chance to develop their online skills in challenging circumstances when some students "dominate the discussion or intimidate others and prevent them from joining in."(Garrison and Anderson, 2003:88). By providing this increased responsibility, learners are encouraged to become more self-directed. The key to successful online learning is the recognition that everyone has a voice and a contribution to make to online discussions. As noted by Grow, (1991:134) "Self-directed learners are willing to take responsibility for their learning, direction and productivity." This does not mean to say that the e-moderator's role is minimised. On the contrary direct intervention from an online teacher, with experience of pedagogical leadership, "moves e-learning into an educational experience." (Garrison and Anderson, 2003:88). The pedagogical framework (Section 4.1.2, Figure 4.2) proposed by Goodyear (1999)

represents shared responsibilities where an online teacher receiving and monitoring e-learner contributions and progress or otherwise, gives his/her timely feedback.

4.2.3 Scaffolding: Social and Cognitive Approaches

The temporary support to encourage higher-order cognitive skills coined as "instructional scaffolding" by Bruner, (1986) is not achieved by an online teacher with a laissez-faire or passive approach (Garrison and Anderson, 2003). It takes a good amount of professional expertise and pedagogical leadership to design a question as the "jumping-off point of a discussion promoting deep exploration of a topic and the development of critical-thinking." (Palloff and Pratt, 1999). That is to say that the online e-moderator role is seen to be one in providing scaffolding (i.e. mediating role to support the acquisition of new knowledge).

Mortimer (1999:48) discusses an alternative view of knowledge construction held by socioculturalists who "assume human agency in the process of coming to know . . . they argue that meaning derived from interactions is not exclusively the product of one person. They view the individual as being engaged in relational activities with others." In other words knowledge is constructed within social situations. In his theory of "Zone of Proximal Development", Vygotsky (1978:126) called a "higher mental function" or a "tool of thought", a mental "organ" which develops over time through "a particular history of social interaction which can operate in any situation."(Grow, 1991:128). Vygotsky defined the zone of proximal development as the distance between the actual stage of development as determined by the individual's level of problem solving and the potential stage of development as determined by problem solving in collaboration and scaffolding through socialisation. In his conceptual framework for learning, Vygotsky, therefore, places emphasis on the social construction of knowledge, where the subject matter can be separated into a number of achievable stages and scaffolded by peers and subject experts.

4.2.4 Setting hypotheses

Wenger (2008:230) talks about "conceptual architecture", which denotes the general elements of a conceptual framework. "It is not a recipe; it does not tell a designer how to perform a specific design." Rather it is can be used as a design tool which has two guidelines. Firstly, the underlying question, the decision-making stages, risks and compromises to achieve the dimensions of the design 'space'. Secondly, questions about the general shape, facilities and basic components. Valdez et al., (2000) use this kind of topological approach in their predictions about learning spaces formed by new learning

technologies. They argue that hypotheses relating to online learning require well formulated structures to assist participation. Jones et al. (2000:19) describes conceptual architecture as "the crafting of affordances", in virtual spaces. In developing hypotheses about online learning Ross et al. (2004:116) defines virtual spaces as "local habitations for individual learners or for learning communities. Such spaces are the embryonic physical manifestations of the learning environment, in all its nested complexity". Goodyear (2000) concludes that the best that online teachers can do in online learning is to design tasks at first which not only bring students together but also guide students into active engagement in constructing their own knowledge; secondly to construct learning spaces which are compatible with the shared online tasks. Making assumptions about online learning and teaching is a starting point for hypothesis development. It is essential that hypothetical statements become operational with explicit meanings and that the hypothesis can withstand scrutiny and testability (Popper, 2002).

4.2.5 Knowledge activation and knowledge application

By gaining knowledge, students should do something with their newly acquired knowledge (Berge, 1995). That is to say, online students should be given opportunities to apply their knowledge through shared understandings with e-peers and online tutor. Gagne (1977) recognised that knowledge application developed a sense of ownership of a specific learnt object. It is by implementing new skills that learners can develop further insight to creating new ideas. When learners become self-directed, they become more confident to tackle new problem-solving activities by applying their prior knowledge (Bruner, 1997). Online learning provides the platform to try out new ideas in a collaborative asynchronous discussion forum where e-peers can exchange their creative insights (Gokhale, 1995).

4.2.6 Individual learning and motivation

Garcia and Pintrich (1994:143) conclude that self-directed students are capable of "monitoring, controlling, and regulating their own cognitive activities and actual behaviour." That is to say that self-regulated e-learners take responsibility of their own learning by being actively engaged with the learning process through reflection and critical thinking. Grow (1991) recognises that encouraging learners to become self-directed will inspire students to engage in lifelong learning. This has implications for e-moderating where the e-moderator's online presence is vital as a pedagogical leader. An online community of inquiry (Garrison and Anderson, 2003:28) is self-organising to a certain extent, where e-learners have opportunities" to negotiate meanings, diagnose

misconceptions and challenge accepted beliefs." With access to vast store of information on the Internet, online learners have a distinct advantage to engage in deep and meaningful learning outcomes within a community of reflective inquiry.

4.2.7 Goal setting

An important element of community in the virtual classroom is the development of shared goals (Pallof and Pratt, 1999). In Laurillard's (2002) 'Conversational Framework' for online learning, goal-setting by the online teacher is a crucial responsibility, because it becomes part of an assessment strategy. Some good advice is given by Berge (2001:23). Berge notes that e-moderators should not expect too much but rather to "be content if two or three well articulated major points are communicated in a particular thread of discuss." Goal setting needs to be clear, precise and clearly articulated (Schön, 1992; Gokhale, 1995; Gagne, 1977). Ramsden's (1991) Theoretical Framework is also underpinned by goal setting to provide a sense of direction in the learning experience. Students need some kind of sign-posting in their learning journey and the goals are the milestones which they reach successfully or not (Goodyear, 2001).

4.2.8 Positive attitude

A positive learning environment enhances e-learner collaboration and the willingness to exchange ideas, (Russo and Benson 2005). It can be argued that online teacher behaviours which support online student engagement are more likely to affect positive attitudes to learning than a laissez-faire approach. Teacher "immediacy", i.e. the distance between the communicators, (Swan, 2002:159) has a direct positive effect on learning outcomes. Garrison and Anderson (2003) recognise the significance of teacher presence in online learning. In an instructivist learning environment, teacher presence is seen to be high, whereas in a constructivist learning environment, teacher presence is seen to be low. For some e-learners an instructivist climate is preferred whilst for others a constructivist climate encourages positive attitudes to learning.

4.2.9 Feedback and reflections

In his model for online learning and teaching Goodyear (1991) adopts a feedback loop. The online teacher takes the responsibility to assess and monitor e-learner progress. In a self-directed e-learner environment, e-learners themselves are encouraged to reflect on their own and each other's contributions in discussion threads.(Berge, 1995).Garrison and Anderson (2003:93) provide a reminder that effective teaching is about goal setting and

assessment. For this to be achieved "assessment must first be congruent with intended learning outcomes." By reflective practices online learners can be free to select their own learning targets and review their own progress with their online peers.

4.3 Summary

This review of the literature highlights not only some common themes emerging from theoretical models for online teaching and learning but also the complexity of devising conceptual frameworks. Schematic representations are construed in a variety of ways. Diagrammatic conceptualisations can take the form of a 'stepwise' progression (Salmon, 2000), a 'ladderwise' progression (Moule, 2007), an hierarchical progression from an inner circle towards an outer circle in a set of concentric circles (Ramsden, 1991), Venn Diagrams (Garrison, Anderson and Archer, 2002: Koehler and Mishra, 2009), connected boxes (Laurillard,2002: Bass and Elmendorf,2009) and charts (Goodyear, 1999). These have all provided the research with some clues which have guided the conceptualization for a model representing an understanding of online learning and teaching. All these theoretical models, in their various individual ways, contribute to an understanding about the assumptions made about online learning and teaching. Dooley (1984:29) gives researchers a reminder that "theories are tentative and preliminary. . . We are not sure about them and that is why we call them theories instead of laws and facts."

This is the concluding chapter of Part One, giving insights to the theoretical background of the research and research rationale. Upon reflection of the many possible theoretical perspectives, the following question was an important one to consider. Would an inductive methodology be more appropriate than a deductive methodology in the formation of an innovative conceptual model (as proposed by the research question)? In some instances theoretical models came about through qualitative interviews using analytical tools for a methodology based on induction (research-before-theory paradigm), others using a methodology based on deduction (theory-before-research paradigm) and yet others from a methodology using induction followed by deduction. These insights are investigated in the next part of the thesis, Part Two, giving an account of the proposed research methodology, beginning with Chapter Five, "Deciding on a Methodology".

PART TWO

Research Methodology

Chapter Five

Deciding on a Research Methodology

5.0 Gearing up to advances in Learning Technologies: A choice of methodologies

In the previous chapter, a variety of models for online teaching and learning were discussed, giving insights to the ways in which researchers are able to develop conceptual frameworks. Examining the various models with a critical lens, it can be argued that online teachers are faced with difficult decisions with regard to selecting and implementing constructivism as the orthodoxy for online teaching and learning when their early exposure to teaching in face-to-face classrooms developed through an instructivist worldview.

The theoretical hierarchical relationship of three nested paradigms (Ramsden, 1991) in concentric circles conceptualises an instructivist worldview at the centre. This is labelled as 'primitive' because learning content is being delivered to 'passive' students. Two other levels, labelled as 'simple' and 'sophisticated' indicate, firstly, the development of organising student activity, as if this would bring about effective learning outcomes. Secondly, the outermost level, a more sophisticated one because of the implications that the processes of teaching and learning are situational, where the teacher is interested to know how learning takes place, adjusting his/her teaching strategy to accommodate learner capabilities. This provides some insight to the nature of teaching as a reciprocal process because whilst a learner receives expertise from a teacher, a perceptive teacher can gauge problems which learners may have, and adapt their teaching style accordingly.

In contrast, Goodyear's (1999) conceptual framework for teaching and learning indicates a paradigm shift from instructivism to constructivism. Pedagogical strategies and tactics are explicitly stated giving insights to notions of pedagogical leadership in developing tasks for student activity. With the advent of Salmon's (2000) five-stage model for online learning and teaching the total immersion in a constructivist environment was heralded as the acceptable praxis, with its adoption in HE and FE institutions in the UK which were equipped with electronic learning platforms to deliver online courses with developmental online text-based activities, so-called e-tivities. Nowadays, multimedia, podcasts (Salmon2011:234), wikis and blogs enhance the learning experience. Two years on, Laurillard's conversational model seemingly based on learner-tutor dialogues introduced the importance of two-way dialogues focusing on both student and teacher reflections and feedback and the adaptation of the teaching style to perceived learner understandings.

In contrast, Moule's (2007) ladderwise e-learning model demonstrated a way of conceptualizing e-learning from an instructivist worldview and constructivist worldview. At first there is a teacher-centred adoption in the use of computer-based resources (Interactive CD-ROMSs, databases and DVDs) as forerunners of learner-centred environments. Moving up the ladder via synchronous communication in the application of videoconferencing, the use of e-mails and asynchronous discussion boards to virtual 'chat' classrooms, are constructivist learning communities of practice online. Similarly, communities of inquiry are established through sociocultural dimensions of learning (Garrison and Anderson, 2003) and social pedagogies are paving the way towards social constructivist learning environments (Bass and Elmendorf, 2009). What appears to come through all of these models is teaching presence, whether explicitly (Garrison and Anderson, 2003) or implicitly in learner-centred environments, where, in some of the models emphasising knowledge creation through online e-learner collaboration, there are hints of teacher-led activities which may be regarded as manifesting an instructivist approach, with less student autonomy. These can, therefore, be *'challenged for their shallow interpretation of the constructivist worldview..."* (Gulati, 2004:1).

It was decided at the start of the investigation that it would be useful to find out from e-moderators, themselves, their perceptions of their online roles with respect to what they do online and what they perceive their e-learners are able to do online. The researcher had already experienced from some of her e-peers in an online module for professional development their difficulty in collaborating and making their views public by postings to the discussion forum. This experience acted as a springboard for the research study.

This chapter, discusses how a research methodology was formulated to answer the research question, using the set of four objectives as a guideline. In the first instance it was essential to obtain substantial evidence from a literature survey to establish the conceptualization of a new pedagogical model for online teaching and learning.

As Conole, Isroff, Oliver and Ravenscroft (2004:1) contend, the research in this area of learning with technology focuses on improving student learning experiences. Individual experiences are influenced by the online teaching style as well as the social interactions amongst e-peers. They state that "...Learning technology research in general is concerned with understanding how technology can be used to support learning and teaching. It involves an underlying motivation of improving the student learning experience..."

In the search for an appropriate research methodology, it was recognized that every discipline has its own epistemological beliefs and associated culture. This includes the discipline of learning technology research underpinned by three inter-related features. Firstly, the area is shaped by the nature of the research questions being explored. Secondly, it is shaped by the research methodologies adopted and the ways in which these are used to address the research questions. Thirdly, it is shaped by the underpinning theory and theoretical perspectives adopted and used in making sense of research findings. Table 5.1 below summarises the main differences between a research methodology underpinned by positivism and an alternative methodological approach i.e. phenomenology. The researcher recognised that by focusing on personal meaning-making adapted Kelly's (1955) personal construct psychology which relates to a phenomenological approach. However an inductive method was not used to analyse the data to find an emerging 'theoretical framework' (i.e. research-before-theory) but rather the data was gathered in a confirmatory procedure to corroborate the initial hypothetical models for online learning and teaching as discussed in Chapter Eight.

Table-5.1 The main differences between the Positivist and Phenomenological Research Perspectives:

	Positivism	Phenomenology
Philosophical Level Basic Beliefs	The world is external and objective. Observer is independent. Science is value-free.	The world is socially constructed. Observer is part of what is observed Science is driven by human interests.
Social Level Researcher should	Focus on facts. Look for causality and fundamental laws. Reduce phenomena to simplest elements. Formulate hypothesis and then test them.	Focus on meanings. Try to understand what is happening. Look at the totality of each situation. Develop ideas through induction from data.
Technical Level Methods & Techniques	Operationalising concepts so that they can be measured. Taking large samples.	Using multiple methods to establish different views of phenomena. Small samples. Investigated in depth or over time.

There is growing dissatisfaction with research into teaching that has been based on quantitative analysis of inventories and attitude scales, which use the researcher's criteria often without reference to the particular situation in which they are applied. Turner (2004:9) emphasises that when researchers "...seek to develop educational theories to explain the operation of educational processes and to develop policies in

education...(they) need to have criteria for successful theories...which can take into account, or at the very least leave room for, individual choice and individual responsibility." Barr et al. (1961) conclude that much research neglects the fascinating diversity of personal goals that teachers may hold. Another observation is made by Morrison and MacIntyre (1969:150) when they were summarizing the massive amount of American research into teacher effectiveness They conclude that "...there is plenty of evidence to indicate that different practitioners observing the same teacher teach, or studying data about her, may arrive at very different evaluations of her; this observation is equally true of the evaluation of experts; starting with different approaches, using different data gathering devices, they too, arrive at very different evaluations..."

A number of British researchers Chanan and Delamont (1975), Sheldrake and Berry (1975), Laurillard (1979) and Britton (1976), are developing alternative methodologies.

As the new emergent learning technologies of multimedia and networked learning platforms are developing at an unprecedented pace from the early computer-based learning models of the late 70s and early 80s, there is increasing evidence (Conole, Oliver, Isrof and Ravenscroft, 2004) that as a relatively young field, learning technology research is not clearly defined, where certain methodological issues have already been raised (Conole, 2003) This includes ways of exploring mechanisms for tracking activity online, exploration of the nature of different types of virtual presence, mobile and smart technology and the development of context-sensitive and tailored learning environments.

There is criticism of much current research activities, which are considered too anecdotal (Dooley 2004:307), case-based, and lacking theoretical underpinning (Ackroyd and Hughes, 1992:154). In addition, as indeed is true in social science research more generally, there are divided views on the importance of quantitative versus qualitative research methods (Morgan, 1983; Cresswell, 1994).The following should not be a taken-for-granted perspective. The choice of methodologies and the way in which the research is carried out in terms of empirical data collection and analysis will have a critical impact on the value and worth of the research findings.

Oliver and Conole (2003) recognize, for example, that action research and evaluation are used extensively, which can be explained in terms of the importance of linking findings back into practice and the importance of ensuring stakeholder engagement in the issues being addressed. Oliver and Conole (2003:394) conclude that "evidence-

based practice inappropriately dismisses qualitative approaches to research. It rests on philosophical traditions of positivism that are arguably inappropriate in an educational setting."

There are also increasingly innovative uses of the technology itself as a tool for research. For example there is now a wide range of software available to facilitate research; online web surveys are increasingly being used for data collection and various statistical and qualitative packages have emerged to support data analyses. These tools enable the researcher to focus less on routine collection and calculation and more on the analysis of outputs (Conole, Dyke, Olive rand Scale, 2004).

Although similar criticisms can be made of the wider field of educational research, Usher, (1996) criticises its lack of reflexivity. What is distinctive about e-learning research is that awareness of the problem is generally lacking. There are some notable exceptions, however. Hodgson *et al* (2001), for example, note the general vagueness over methodology in much published research and a tendency towards objectivist perspectives on e-learning. Such work largely relies on naïve measures of effectiveness such as exam score difference or Likert-scale expressions of satisfaction. They also question whether the adoption of research methods designed for face-to-face settings are appropriate to use online, illustrating (for example) how new approaches have developed for the analysis of asynchronous computer-mediated communication (CMC). Likewise, McConnell (2001) explores the relationship between technology and research methods. He observes, that the kind of research which uses CMC seems to encourage participant engagement, whilst that which uses technology to distribute research instruments diminishes it; that transcripts automatically arising from networked learning can be used as a stimulus for discussion in interviews; and that data arising from CMC can be analysed using traditional methods such as grounded theory or ethnography. Jones (2001) questions whether the assumptions of ethnography require modification when it becomes virtual ethnography. Jones (2001) notes the opportunities for misunderstanding, but concludes that the ethnographic emphasis on participation is important if the researcher is to appreciate what this experience is like for their research participants.

The impact of such discussions is significant, if largely unobserved. For example, in America, particular theoretical positions have now been enshrined in law. The "No Child Left Behind" Act (2001) and the associated National Research Council Report (2002) place explicit value on experimental studies within education. Taking an activity

theoretic perspective, this situation introduces conflicts into current systems of research. Specifically, in Activity Theoretic terms (Issroff and Scanlon, 2002), a contradiction arises between the rules of the community and those of individual subjects. This is deliberate: by sanctioning (and funding) certain kinds of research at the expense of others, the government is creating problems for researchers whose theoretical positions differ from their own. I note that researchers working within a relativist (typically, qualitative) paradigm are disadvantaged by this development, whilst those with an objectivist perspective (typically, quantitative) are advantaged. This legislation provides them with new tools (permissions and funding) allowing more opportunities for research activity than was previously the case. Such governmental sanctioning of theory via method has been challenged as being philosophically, socially and morally inappropriate (Oliver & Conole, 2003).

An explicit example of this can be seen in research on computer-supported cooperative learning (CSCL). In Issroff's publication (1993) guidelines for research are set out. Research focusing on computer-supported cooperative learning started in developmental psychology and initially used rules, tools, and divisions of labour developed by that community. Over the last ten years there has been a shift in research in the area towards naturalistic learning settings with an emphasis on practical applications and use. This shift has led to a change in the research methodology used. Issroff's (1993) guidelines reflect this shift. One of the contradictions which led to this change was that research on the use of technology in artificial settings led to expectations and findings which then were difficult to translate into information that was useful in real learning settings. The realisation that context and other features of the setting make a difference led to a change in the rules of practice for this community. One example of this is the way in which students are put into pairs/groups. Theories of cognitive conflict led researchers to create collaborating pairs of students who were matched by their conceptual knowledge (either the same or different). This theoretically-driven methodology was very fruitful in terms of understanding the role of conflict. However, researchers realized that other factors also impacted upon collaboration – for example, friendship. This led to a contradiction between the tool (the research methodology) and the object (to carry out research that is relevant to practice).

The implication of these examples is clear. If, as Hodgson et al (2001) argue, theoretical commitments remain vague in e-learning research, problems will continue to occur. Inappropriate inferences will be drawn from published papers and interdisciplinary

teams will encounter problems attempting to undertake research. Two developments are possible in response to this. Either a single position will be advocated (as in the US), causing problems for any deviant who believes differently, or else all e-learning researchers will have to be encouraged make their position clear, so that differences can be understood and respected (for example, by judging each piece of research on its own merits). Although this latter option is likely to be harder to achieve, it is doubtless the more desirable, since such community-led revision of acceptable rules of practice through critique and discussion represents an important opportunity for social learning within the field.

To conclude, in order to address the criticism that learning technology research lacks scientific rigour, I argue that learning technology research needs to be articulated within a broader and more holistic socio-cultural framework for cognitive change (Ravenscroft, 2002, 2003a). There needs to be a clear conjoining of research into socio-cognitive and socio-cultural aspects of the educative process. This ambitious approach will require explicitly integrated theoretical, empirical and computational (or design-oriented) approaches and consideration of the methodologies of cognate disciplines within an 'educational socio-cognitive science paradigm'.

In light of the above issues about learning technology research, we need to think outside the box with a systematic and scientific approach. As part of this reflection we also need to consider the use of research findings and in particular its relevance to policy and practice. It should not be forgotten that learning technology research is a practical and applied discipline, which is inherently contextualized..

A comprehensive overview of learning technology research and associated methodological and theoretical issues has been presented in order to clarify a choice of research methodology. Strauss and Corbin (1990:44-46) have suggested that grounded theory based on induction (Glaser and Strauss, 1968), allows the researcher to be scientific and creative at the same time, as long as the researcher follows three guidelines, i.e. (i) periodically step back and ask "what is going on here? Does what I think I see fit the reality of the data? (ii) Maintain an attitude of skepticism. Theoretical explanations and questions about the data "...whether they come directly or indirectly from the making of comparisons, the literature or experience, should be regarded as provisional and checked against the data, and never accepted as fact" (Dooley, 2004:

292). (iii) Follow the research procedures. The collection and procedures for the analysis of the data should be designed to give rigour.

Despite many researchers advocating the collection of data from actual online transcripts and use of content analysis, there are many ethical issues regarding this method, especially in obtaining permission from all online participants. The invisibility of a researcher's access to e-learners postings on asynchronous electronic discussion boards may cause concerns. Since online tools give researchers opportunities to observe an electronic discussion group without introducing themselves, or intervention of their agenda, many may see this as exploitation since the automatic tracking of transcripts are archived as permanent records. If the research data were to be scanned from the postings of the e-moderator to the e-learning community, then there are additional personal issues regarding the nature of the postings from an e-moderator to individual e-learners. For example, e-learners may be addressed by their individual names in e-moderator postings, thereby technically exposing ideas identifiable and traceable to individual research subjects. The question of who to ask permission for access to these then becomes an issue of critical significance (Klinger, 2000).

Pachler and Daly (2011:143) conclude that the implementation of an inductive methodology using online transcripts "...works explicitly with the researchers' self-aware engagement with the wider e-learning practice under investigation...(and) has been the subject of intense interest and debate. There has been continued review of the 'problem arena' of researching CMC based on methodological flaws in research instruments which affect reliability and validity."

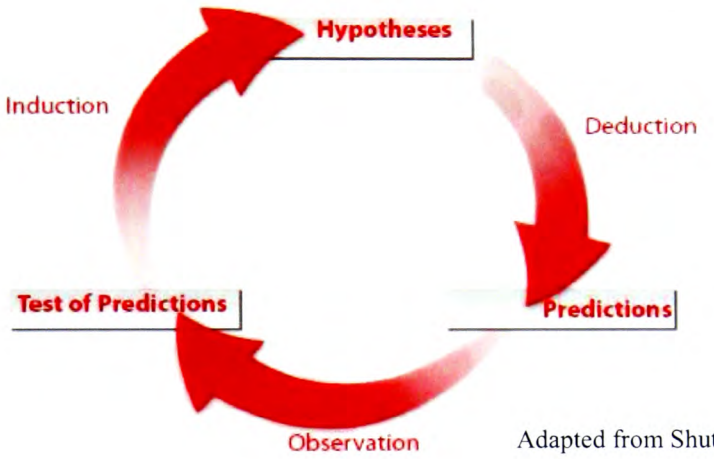
Alsop and Tompsett (2002) consider the use of two approaches which have gained considerable popularity in the area in recent years; namely the use of grounded theory and activity theory. Jones (2001) considers how quantitative and qualitative approaches can be brought together in a meaningful way, for example by the use of Phenomenography / Variation theory. Steeples (2003) reports on the use of an action/participatory research approach.

5.1 Choosing a Methodology: Advantages of Hypothetico-Deduction

In considering the choice between an inductive methodology and a deductive methodology it was decided to implement a hypothetico deductive methodology (Ackroyd and Hughes, 1992; Willig, 2001; Popper, 2002; Shuttleworth, 2008) because I was following a "theory-before-research" paradigm. I did not intend to explore specific

data first and then attempt to discover a meaningful pattern or conceptual framework. It was rather, the opposite. As Babbie (2004:25) puts it "...sometimes we say things like, this is true 'in theory'. To complete the process, we test whether they are true in practice." The diagram below illustrates the life cycle of events occurring when adopting the hypothetico-deductive methodology. According to Popper (2002) who rejects inductive reasoning, it is of no importance where hypotheses come from. A hypothesis can be a statement of an idea or speculation which is testable, falsifiable and realistic.

Figure 5.1 Hypothetico-Deduction Research Methodology



Adapted from Shuttleworth (2008)

Implementing this methodology as the foundation of the research investigation, the initial objective to conceptualise a hypothetical framework for online teaching and learning would start at the cycle labelled hypotheses (Diagram 5.1). The next stage is the data collection, i.e. objective (ii) followed by objective (iii), i.e. data analysis using a deductive methodology, to corroborate the hypothesis (i.e. conceptual framework, model for online teaching and learning). When corroboration is complete, objective (iv) follows where the corroborated model is rigorously put to the test of falsification, then and only then when the model has withstood against falsification is it possible to claim the model as a falsifier against the orthodox theoretical framework.

5.2 Conceptualisation of a Theoretical Model for Online Teaching and Learning

In a previous research study (Rogers, 2004) an investigation (Appendices B1-B3) was carried out on e-moderator perceptions of their online roles through a leadership paradigm (Avolio, Bass and Jung, 1999). It was concluded that e-moderators explicitly

demonstrated four transformational leadership qualities (i.e. idealised behaviour, inspirational motivation, intellectual stimulation, and individualised consideration) as shown in Graph 6.1 (Chapter Six) were relevant and important to their online roles in asynchronous learning environments. These outcomes were based on the implementation of a modified multifactor leadership questionnaire (MLQ) formulated from an MLQ originated by Avolio and Bass (2002). The research carried out by me (Rogers 2004) became pivotal for the research methodology, in as much, as the two leadership behaviours i.e. (i) Transactional, task-giving and (ii) Transformational, motivational support, underpinned the conceptualisation of the first model, Model 1 for online teaching. A second model was conceptualised using two variables (i) collaborative capability and (ii) knowledge construction ability found to be the basis for online constructivist student-centred learning. The third model was conceptualised as the merger of the first two models. Each of the models were testable, had corroborability and falsifiability, the three features necessary for a deductive procedure to be implementable (Popper 2002).

The deductive methodology was the best way to use the data from Empirical Study 1 in contrast to implementing an inductive methodology because the researcher already had conceptualised the three models for online teaching and learning (Chapter Six). It was necessary to find a means to collect empirical data firstly to corroborate Models 1, 2 and 3 and secondly to establish Model 3 as a falsifier to the orthodoxy of the worldview for constructivism as the one-size fits all for teaching and learning online.

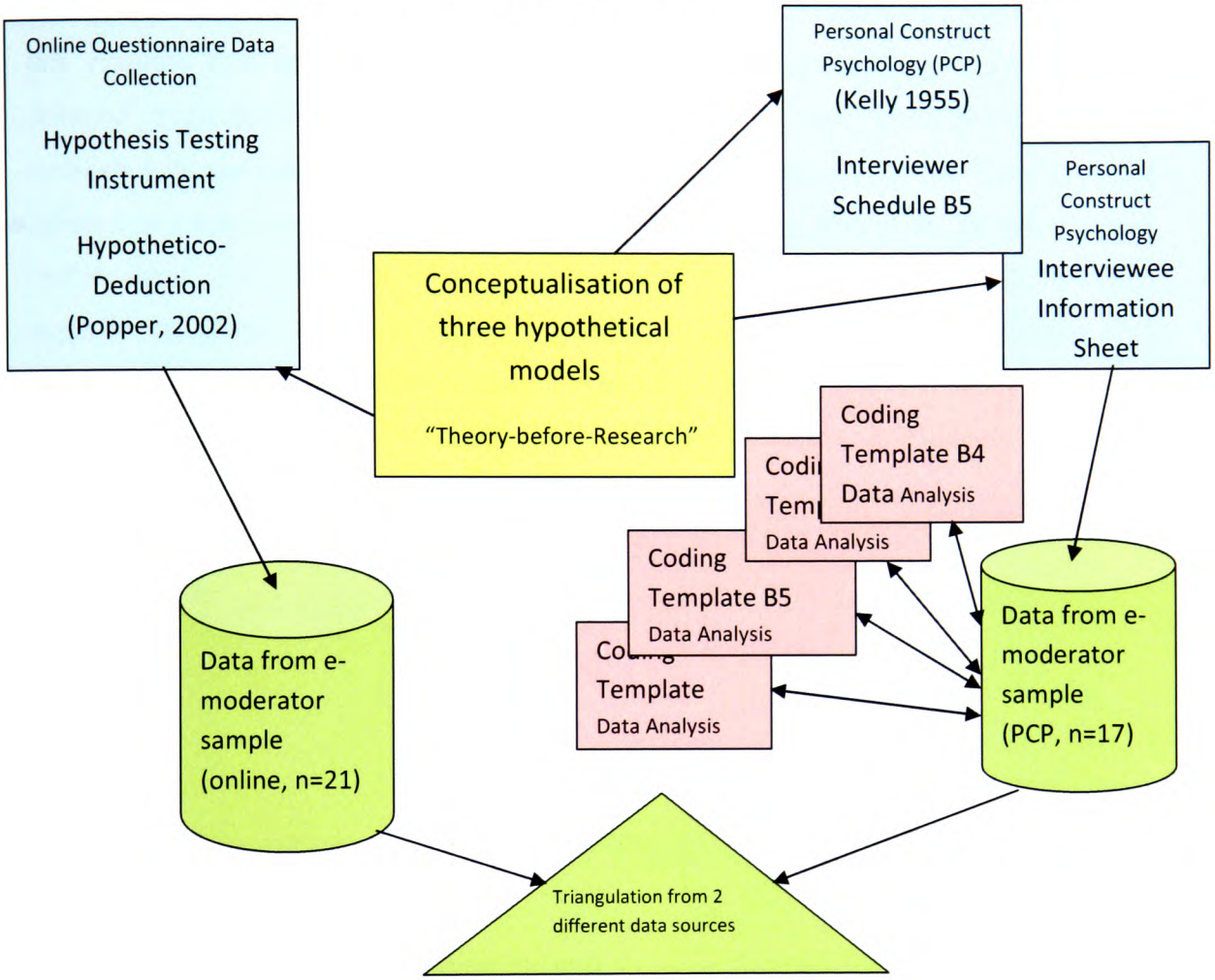
In the next chapter, Chapter Six, a detailed account is given on how the pedagogical hypothetical model was conceptualised both in term of what e-moderators perceive they do online and what they perceive their e-learners are able to do online. Cognitive mapping used by Salmon (2011:29) implementing COPE software proved to be extremely efficient for the large Open University data samples that were available for Salmon's research.

5.3 Research Methodology: Developing a Research Strategy

The first task in the research programme was to conceptualise three hypothetical models. Popper's (2002) methodology is based on a hypothetico-deductive approach. That is to say "theory-before research". Figure 5.2 shows how the research revolved around the initial research stage in which the conceptualisation of the three hypothetical

models took place. This stage is discussed in the next chapter, Chapter Six. The ways in which the two empirical studies were carried out for data collection and data analysis is illustrated.

Figure 5.2 A visual representation mapping the research methodology and methods



Key The Right-hand side illustrates the first empirical data gathering study and analysis
The Left-hand side illustrates the second empirical data gathering from an online sample.

The initial stage was followed by an empirical study, Empirical Study 1 (n=17), adapting Personal Construct Psychology, discussed in Chapter Seven. These approaches are further discussed in Chapter Seven. Chapter Eight discusses how the data in the first empirical study was analysed. Chapter Nine relates to the research strategy for Hypothesis Testing with an online questionnaire in a second empirical study, Empirical Study 2 (n=21).

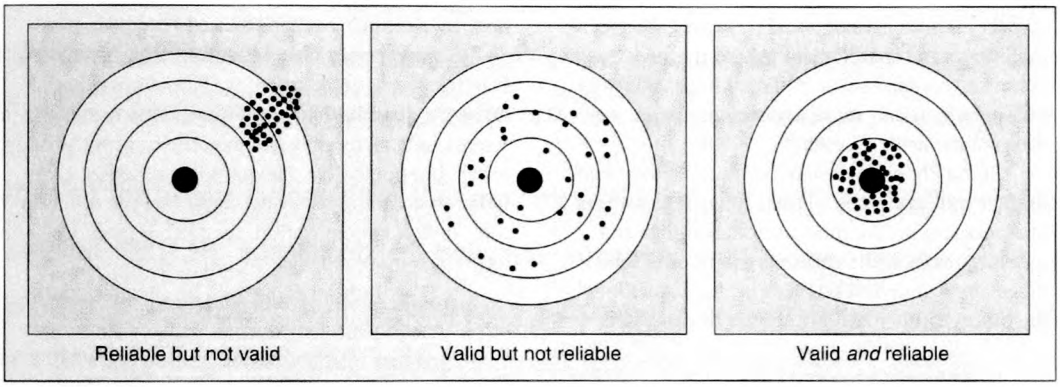
As shown in Figure 5.2 the data gathering, in Empirical Study 1 used a participant interviewee information sheet (Chapter 7) and an interviewer interview schedule

(Appendix B6). Triangulation of the findings from Empirical Studies 1 and 2 is discussed in Chapter 14 which indicated that it was possible to identify the degree of validity in the data from the two different sources.

5.4 A Question of Reliability and Validity

The question of reliability and validity is an important one for research generally and for this research investigation in particular. For a research methodology to be reliable, different researchers should be able to get the same outcomes when using the same methods with similar sample populations. Validity is more important still. Validity is not inherent in a measure as Dooley (1984:51) states, but is "a function of the fit of a measure and its label", i.e. what it is meant to measure. Babbie's (2004:145) diagram, with the target in the centre, shown in Figure 5.3 below, illustrates the nature of reliability and validity clearly, where reliability is a function of consistency.

Figure 5.3 The difference between reliability and validity (Babbie, 204:145)



Validity is a function of shots hitting the bull's eye, or close by. The failure of validity is consistently off the mark and the failure of reliability is random distribution. An interpretation of how these two functions of reliability and validity relate to the research processes and outcomes of the two empirical studies will be found in Chapter Fifteen which discusses the triangulation of data.

5.5 Personal Construct Psychology: Empirical Study 1 Data Collection

Educators are beginning to recognize potential application of a personal construct approach to education (Pope and Keen, 1981) which may have a significant impact on educational research of the future. It is suggested that the relationships between particular assumptions of psychological development and philosophies of the nature of knowledge play a part in determining pedagogic practice. It was believed by the researcher that these assumptions also provide a framework for educational research.

The work of Kelly (1955) would seem to offer both a theory and methodology based on an epistemological position which would support much of the current emphasis in education on personal relevance and endeavour, relativity of knowledge development of expertise and extension of the objectives of educational research. Salmon and Bannister (1974:35) advocate a similar position and suggest that education could be reappraised "in the light of personal construct theory."

However, despite the fact that Kelly's (1955) theory and methodology form a coherent approach, which is consistent with many of the ideas on pedagogy, relative little use has been made within the educational sphere, of the techniques he evolved. It is Kelly's philosophy of constructive alternativism will herald a difference in the way educationalists will undertake effective research initiatives. By adopting this philosophy of constructive alternativism, ways and means may be forged to provide an adaptive educational system which assumes many ways of succeeding and multiple goals from which to choose. That is to say that an educational system in which individual learning preferences are important becomes a focus for educational research, based on the individual's perspective. Constructive alternativism invites innovation, rejecting dogma.

In light of the above rationale for the implementation of personal construct psychology it seemed that an adaptation of personal construct psychology would allow the researcher to investigate both e-moderator perceptions of their online roles and their tacit knowledge regarding their online practices in sustaining effective learning.

There are researchers, Tomico, Karapanos, Levy, Mizutani, & Yamanaka, (2009:213) who suggest that variants of the repertory grid techniques can be experimented with. That is to say that "if the elements are part of the researcher's system of professional constructs, the use of the repertory grid technique would be more of a test, in the conventional sense, than a phenomenological tool." In other words, when a researcher intends to corroborate a hypothesis rather than use the repertory grid for *exploring* ideas to build upon by a phenomenological inductive approach. Kelly's (1955) original method used 24 'role titles' as elements (Fransella, Bell and Bannister, 2004:19-20) to *explore* his client's innermost thoughts, feelings and emotional states. In contrast, Jankowicz (2003) contends that supplied elements can provide a *focus* on the research *hypothesis* for the elicitation of bipolar constructs to be implemented during construct elicitation. Other researchers (Curtis, Wells, Lowry, and Higbee, 2008; Tomico, Karapanos, Levy, Mizutani, & Yamanaka, 2009) contend that experimental variants of

Kelly's personal construct psychology can be used in confirmatory research as opposed to exploratory research.

On the basis of a practical approach, regarding reliability of a research instrument, Fransella, Bell and Bannister (2004:133) conclude that some people regard reliability as "the tendency of a test to produce exactly the same result for the same person at different times." However, Mair (1964) urges that a measure of reliability is more to do with the aim to assess predictable stability and predictable change. This is more relevant to the process of construing events, as "the idea of a static mind is a contradiction in terms" (Fransella, Bell and Bannister, 2004:133).

Chapter Seven discusses in detail the research procedures for the elicitation process, selecting as elements six e-moderator competencies (weaving, archiving, summarising, scaffolding, knowledge construction and socialising).The ways in which the empirical data was collected and recorded in this first empirical study, is discussed in Chapter Seven. The data was then used to corroborate the hypothetical framework. The methodology implemented for the corroboration process is outlined in the next section, Section 5.4 and more fully in Chapter Eight.

5.6 Deductive Methodology adopted for Corroboration

In this section the methodology used to corroborate the three conceptual models constituting the hypothetical framework for online teaching and learning is presented in outline. From the elicitation of bi-polar constructs as explained in Chapter Seven, it was possible to gathered data statements after conducting a pilot test, with two samples of e-moderator practitioners (Initial Pilot Sample (n=3), 2nd Pilot Sample (n=10)). This was followed by a method using content analysis with coded templates (Appendix B4 and B5) specifying characteristic features of the three hypothetical models. The interviewer interview schedule is to be found in Appendix B6. Providing the participant interviewee with an Information Sheet (see Chapter 7) and using the guidelines of the interview schedule, the interviewer was able to collect the data without difficulty, using a tape-recorder and making notes.

The coding in this process involved the logic of conceptualisation and operationalization. Descriptions for the coding of four conceptual variables (transformational and transactional online teacher behaviours and collaborative capability and knowledge construction ability for e-learner behaviours were used and

the combinations of these for the initial classification and labelling of concepts A systematic process followed by matching fragments from e-moderator statements with the criteria on the coded templates. A tally count for each variable and associated attribute and combinations of these was set up. (Chapter Eight, Sections 8.1 and 8.2). The results of this procedure are recorded in Part Three, Chapter Twelve.

The next stage in the hypothetico-deductive life cycle is hypothesis testing (Popper, 2002; Shuttleworth, 2008). This is discussed in the next section.

5.7 Hypothesis Testing: Strategies for Falsification of Conceptual Model

After the hypothetical model for online teaching and learning had been conceptualised and corroborated it underwent a process of hypothesis testing. When corroboration is successful the conceptual framework may be used as a potential falsifier, but it must itself be open to falsification. Possible methods of falsification were considered such as semi-structured interviewing technique, focus group investigation and survey by questionnaires. The selected strategy was an online questionnaire which was piloted first to find out if there were any discrepancies or alterations to be made. In Chapters Nine and Ten I discuss the procedure more fully.

The researcher had the opportunity to attempt an honest falsification of the model to observe whether it withstood open scrutiny by designing a questionnaire which included diagrams of Model 1 and Model 2. The underlying principle was to identify whether research participants agreed or not, with the intended outcomes when the two models were merged. It was important to recognise whether alternative plausible rival explanations were given by the research respondents. The sample population (n=21) responded to the online questionnaire (Appendices C! and C2) within a week of receiving it with a covering online letter. The data collected in the open-ended questions were easily reproducible, in the electronic format, for data analysis. The results of this online survey are to be found in Part Three, Research Findings, Chapter Thirteen.

This was the final hypothetico-deductive stage of the research investigation. An account relating to ethical issues in the research procedures is given in the next section.

5.8 Ethical Issues in the Research

The importance of the research being conducted in an ethical manner lies in the fact that it is the right of the research community to expect that the research will be carried

out rigorously, scrupulously and with an ethically defensible approach. This required careful planning by respecting the wishes of those who took part, regarding the final outcomes and consequences of the research findings. This is the reason why ethical issues were considered at length in the initial stage of the research methodology.

Cohen, Manion and Morrison, (2001:27) conclude that "The planning of research is not an arbitrary matter; the research itself being an inescapably ethical enterprise." The research took place in four stages namely (i) the conceptualisation of a hypothetical framework for online teaching and learning using a leadership paradigm and evidence from the research literature and a previous empirical study (Rogers, 2004) (ii) empirical data gathering adapting a methodology based on personal construct psychology (Kelly, 1955), by finding out how e-moderators perceive their online roles in asynchronous discussion boards (iii) content analysis to corroborate the hypothetical model and (iv) a Hypothesis testing stage for the falsification of the hypothetical framework

Before beginning the stages for empirical investigation i.e. (ii) and (iv) in the research study, it was important to consider the ethical implications involved in data collection from willing participants. All the participants in the research samples were experienced e-moderating practitioners, except three novice e-moderators in the initial pilot study in (ii), who agreed to take part in the research. As in sound research practice, ethical considerations were agreed relating to (a) confidentiality, (b) anonymity and (c) freedom to withdraw at any time from the research process.

In the first stage the research participants were invited to take part in the research by a letter explaining the aim of the research and how the interviews would be conducted adapting the methodology of personal construct psychology. Also the way in which the results would be recorded in writing and used in electronic format for data analysis was explained.

5..1 Informed Consent

Informed consent and co-operation of the research subjects was sought, both for the first empirical investigation using face-to-face interviews adapting a personal construct psychology method and also for those research participants for the second empirical study online for data capture, to test the hypothetical frameworks using an online questionnaire. Diener and Crandall (1978:.14) suggest that informed consent is "the procedures in which individuals choose whether to participate in an investigation

after being informed of the facts that would be likely to influence their decisions." On the other hand Frankfort-Nachmias and Nachmias (1992:37), point out that "the principle of informed consent should not...be made an absolute requirement of all social science research. Although usually desirable, it is not absolutely necessary where no danger or risk is involved. The more serious the risk to research participants, the greater becomes the obligation to obtain informed consent."

The definition provided by Diener and Crandall (1978) may be seen to relate to four elements, namely, (a) competence, (b) voluntarism, (c) full information and (d) comprehension. Competence, here implies that the potential research subject has the ability to decide whether to take part or not, after being given all the relevant information. There was no case where potential research participants were incapable of making such decisions either because of immaturity or some form of psychological impairment.

The nature of voluntarism is underpinned by applying the principle of informed consent, thereby ensuring that potential research subjects freely choose to participate or not in the proposed research. This element of the definition also should guarantee that exposure to possible outcomes is undertaken knowingly and voluntarily.

Full information implies that consent is fully informed, but in practice, it may be impossible for researchers to inform potential research subjects of everything because researchers themselves do not know everything about the investigation and in such circumstances the term 'reasonably informed consent' may be adopted.

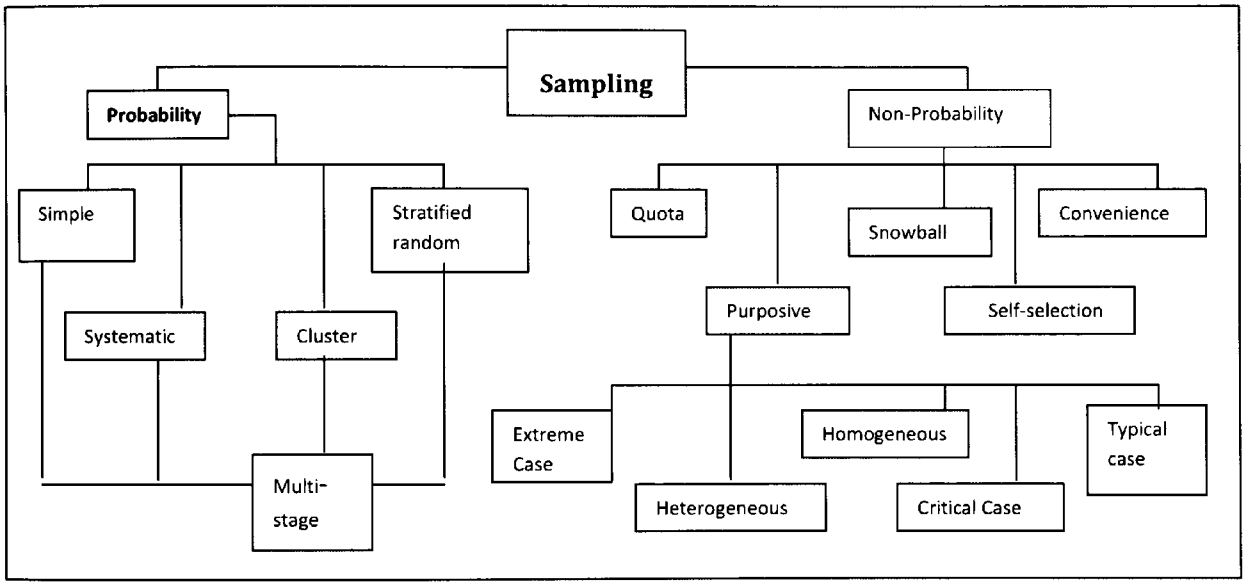
The element of comprehension, seeks to ensure that potential research subjects fully understand the nature of the research investigation, even when the research project entails complicated procedures. The face to face interview technique adapting personal construct psychology in itself has no inherent difficulties. Data subjects decide freely for themselves how to construe their bi-polar constructs and give explanations of their choice.

5.9 Research Data Subjects: How are participant e-moderators recruited

Due to the scarcity of known practicing e-moderators, participant e-moderators were recruited through snowball sampling. For Empirical Study 1, two e-moderators who had agreed to participate were asked to identify further cases and these in turn were asked to identify further new recruits and so on, so the sample snowballed. The following figure, Figure 3.1, indicates the plethora of sampling techniques. The

research design was not based on a large quantitative survey requiring probability techniques to devise sampling procedures, but rather the research rationale was based on personal interview procedures adopting Personal Construct Psychology (Kelly, 1955) in the first instance (Empirical Study 1) and on an online Hypothesis Testing Instrument (Empirical Study 2). The disadvantage, however of using <30 respondents (Saunders, Lewis and Thornhill, 2009) means that no generalisabilty of the research outcomes can be made using statistically significant outcomes; but rather that the outcomes specific to a particular research investigation provide a contribution to knowledge in the respective area of study.

Figure 5.4 Sampling Techniques (Saunders, Lewis and Thornhill, 2009:212)



The non-probability technique of convenience sampling or as it is sometimes called, accidental or opportunity sampling was initially considered to be a good starting point, because it permits choosing the nearest individuals to serve as participants. This was a feasible technique since it would be less complicated to simply choose a sample of e-moderators in ECW (e-college Wales, associated with the University of Glamorgan) and possibly a sample from the Open University, who had trained on the same online e-moderating course as the researcher. However, this approach was not adopted due to concerns regarding researcher-bias.

Instead both the empirical studies adopted a sampling procedure using the snowball method where the volunteer participants each nominated suitable persons to be invited to take part in

the study. This proved to be an effective method for recruiting sufficient participants for two pilot studies and a final representative research study for data collection.

This snowball sampling provided a small number of individual participants having the characteristics of experienced e-moderators (e.g. with a minimum of 3years' experience) or that of a 'novice' e-moderator (a 'first-timer'). These individuals then acted as informants to identify, or put the researcher in touch with others who qualify for inclusion and these in turn identify yet others- hence the term snowball sample.

A summary of this chapter now follows.

5.10 Summary

This chapter introduced the advances in the research on the new emerging learning technologies. There was widespread evidence on the different research methodologies that had been implemented. The choice between an inductive methodology or a deductive methodology was considered. A model of the life cycle of events in hypothetico-deduction was given (adapted from Shuttleworth, 2008) illustrating how in a cycle of events, deduction stimulates the generation and testing of theoretical frameworks. The discussion in Section 5.1 showed how a choice was made for the implementation of a deductive methodology based on the strength that the conceptualisation of a theoretical framework for online teaching and learning had been established that exhibited the three requirements (i.e. testability, corroborability and falsifiability) for a deductive methodology to be implemented.. The conceptualization of the hypothetical models for online teaching and learning was presented in Section 5.2 with an explanation of the variables involved and in Section 5.3 the methodology for the collection of empirical data, adapting personal construct psychology in an idiosyncratic way was described and explained. An important stage in the research was the corroboration of the hypothetical models using the empirical data from e-moderator practitioners rather than from an e-learner sample, because the original Model 1 was based on e-moderator perceptions of their online roles (Rogers, 2004) through a leadership paradigm (Avolio, Bass and Jung, 1999) which had not been previously pioneered and the researcher wanted to pursue this further. Finally the different hypothesis testing strategies for falsification of a conceptual model was explored in general and the use of an online questionnaire in particular. This involved an honest way of looking for plausible, alternative rival explanations to those of the proposed hypothetical framework for teaching and learning online.

In each of the sections above references are given in the dissertation where each of the stages of the hypothetico-deductive model, relevant to the research investigation are to be found.

Ethical considerations are of importance in any undertaking where research participants are involved so to ensure anonymity and their right to personal privacy, confidentiality of their information and freedom to withdraw at any time. The research data was anonymised both in the electronic archived format and in the written body of the dissertation. In the next chapter, Chapter Six, an account is presented on how the three models, Model 1, Model 2 and Model 3 were conceptualised and graphically presented.

A visual representation of research procedures was provided (Figure 5.2) to clarify how the current research used Rogers (2004) MAPD research findings as a lever. Reflecting on previous experiences from ECW e-moderator training (i.e. MAPD studies, 2003/04) led to the opportunity of designing a method for eliciting e-moderator perceptions of their online roles and relationships based on Personal Construct Psychology in the current research process. The decision to adopt a leadership paradigm (Bass and Avolio, 1989) was due to the findings from a multifactor leadership questionnaire (Rogers, 2004: Appendices B2 and B3). These findings showed that e-moderators in a representative sample (n=30) from the University of Glamorgan recognised their transformational and transactional leadership qualities in their online roles and relationships. Now that it was clear that leadership is a recognisable attribute for online teaching, the current research developed the new *Pedagogical Variation* Model for online teaching and learning based on a leadership paradigm and adapted Personal Construct Psychology (Kelly 1955) to corroborate the model. The hypothetico-deductive methodology (Popper, 2002) was applied to test the model with the aim of refuting the basic underlying assumptions. Whilst the model withstood the attempts of falsification, it is tentatively presented as a conceptual model open to further rigorous scrutiny.

Chapter Six

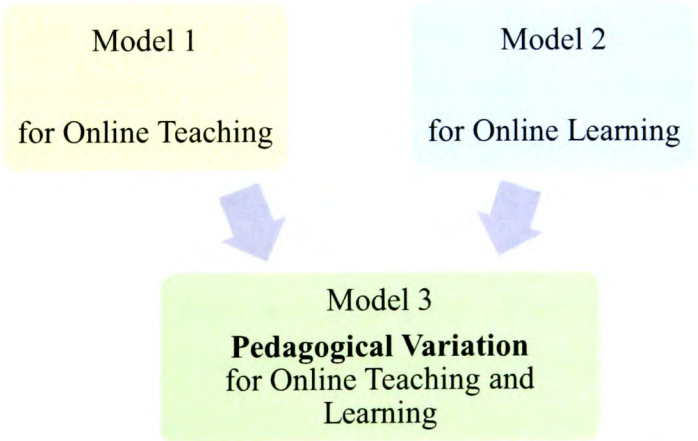
Conceptualising a Hypothetical Model for Online Teaching and Learning

6.0 The Initial Stage of a Hypothetico-Deductive Methodology

This chapter describes and explains how a hypothetical model was conceptualised for pedagogical variation for online teaching and learning, in asynchronous discussion forums. Popper (2002: 37) concludes that "theories are nets cast to catch what we call 'the world' to rationalize, to explain and to master it. We endeavour to make the mesh ever finer and finer." This describes neatly how researchers cast their primitive nets into a vast sea of theoretical assumptions about teaching and learning in general and in online teaching and learning in particular.

The conceptualization of the hypothetical model took place in three phases. Firstly, the conceptualisation of a model for online teaching, namely Model 1. This was followed by the conceptualisation of a second model for online learning, Model 2. In the third phase, these two models were combined in the conceptualization of Model 3, resulting in a Model for *Pedagogical Variation*, illustrated in Figure 6.1

Figure 6.1 A Hypothetical Configuration for Teaching and Learning Online



The next five sections provide explanations for the assumptions underpinning each hypothetical model. Descriptions are given on how a 2 x 2 matrix design was implemented for each model illustrating how the various factors involved contribute to the rationale on

which the models were based. The Boston matrix, as this graphical format is known, "is best used as a loose conceptual framework" (Burns, 2001:282).

6.1 Model 1: How did a Leadership Paradigm influence the Research?

The assumptions that were made regarding the implementation of a leadership paradigm for the conceptualisation of a model for online teaching are discussed in Chapter Three. In an earlier investigation (Rogers 2004) a methodology, underpinned by a leadership paradigm was adopted, relating to transformational and transactional leadership (Avolio, Bass and Jung, 1999) to identify and analyse e-moderator perceptions of their online roles. The method involved the design and implementation of a research instrument based on the modification of a multifactor leadership questionnaire (MLQ) using a 5-point Lickert scale, first introduced by Bass and Avolio (1989).The MLQ was modified slightly by introducing the words 'as an e-moderator' instead of 'as a leader'. This modified MLQ is appended in Appendix B2.

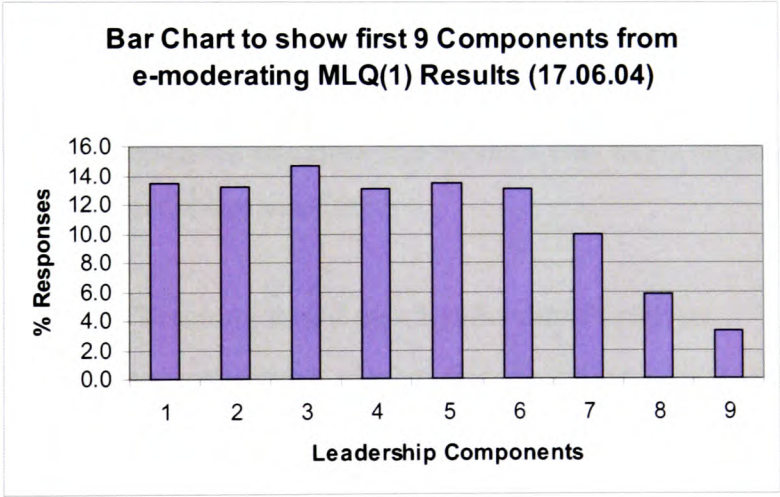
The original thirty-nine items were adopted and these fell into ten fundamental constructs or factors as described by Bass and Avolio (2002). That is to say, five factors describing transformational leadership, three factors describing transactional leadership, one factor describing a *laissez-faire* component and one factor indicating whether responses to these were perceived by e-moderating practitioners to elicit the factor of 'extra effort' from the e-learning community. This questionnaire was originally based on seven leadership factors that were examined by Avolio and Bass (1993) in their earlier work as shown in Chapter Three, Chart 3.2 and then extended to 10 factors three years later (see Appendix B2) Data for the investigation (Rogers, 2004) was gathered using the self-administered MLQ from a representative sample (n=30) of e-moderators, who had a minimum of three years online teaching experience. Each of the 39-items was factor analysed (Keeves, 1997) by the method of a principal components analysis (PCA) whereby a scree plot was obtained. The results revealed that e-moderating, according to their (e-moderator) perceptions, did involve some kind of leadership. This was not surprising because Dulewicz and Higgs (2002) contend that people with leadership qualities show a greater degree of emotional intelligence displaying self-awareness and interpersonal sensitivity which Salmon (2011) recognises as important competences for successful e-moderating.

By using a PCA method, Rogers (2004) isolated four factors in a scree plot, namely (1) idealised behaviour (IB) (2) inspirational motivation (IM) (3) intellectual stimulation (IS) and (4) individualised consideration (IC). The results are supported in research findings by

Bycio, Hackett and Allen (1995) and Carless (1998). The other transactional components became less important i.e. (5) contingent reward (CR) (6) Management-by-Exception (Active) (MBE-A) (7) Management-by-Exception (Passive) (MBE-P) (8) *Laissez-Faire* (9) extra effort (EE).

A bar chart, shown in Graph 6.1, indicated that e-moderating practitioners in the research sample (n=30) regarded transformational behaviour (i.e. a behaviour which empowers e-learners, by giving motivational support) as an important aspect of their online role. This aspect is almost lost in the research literature (Berge and Collins, 1995).There are numerous citations regarding the necessity of providing structured online tasks (Paulson, 1995; Mason, 2001; Laurillard, 2002; Salmon, 2002a). This transactional e-moderating style (task-giving behaviour) together with transformational e-moderating behaviour is shown in Graph 6.1.

Graph 6.1 Comparison of e-moderator perceptions of their online roles based on their identification of Transactional and Transformational leadership styles (Rogers, 2004)



Key

1. Idealised Influence
2. Idealised Behaviour
3. Inspirational Motivation
4. Intellectual Stimulation
5. Individual Consideration
6. Contingent Reward
7. Management by Exception: (Active)
8. Management by Exception: (Passive)
9. *Laissez faire*

This graphical representation clearly indicated that based on the perceptions of e-moderator practitioners there was more to online learning and teaching than a transactional, task-giving role. In the above graph the strongest component is seen as component 3, inspirational motivation, followed by components 5, 1, 2 and 4, namely

individual consideration, idealised influence, idealised behaviour and intellectual stimulation i.e. transformational behaviours.

From these outcomes, it became clear that e-moderators in the sample population had regarded their transformational behaviour or motivational support (described by the first five components) as more significant to their online role than their transactional or task-giving behaviour (depicted by the components 6, 7 and 8).

These results provided evidence that a leadership perspective was relevant to the research study because a purely constructivist paradigm where e-learners collaborate effectively, constructing knowledge amongst themselves, is not necessarily a common occurrence online in the absence of pedagogical leadership (Garrison and Anderson, 2007). These aspects, challenge e-moderating behaviours in the virtual classroom in absence of body (Stone, 1991).

These results form the cornerstone for the emerging pedagogical model for online teaching relating to e-moderator perceptions of what they do online in asynchronous discussion forums from the point of view of a leadership paradigm. According to Hersey and Blanchard (1982:3) "Leadership occurs at any time one attempts to influence the behaviour of an individual or group, regardless of the reason. It may be for one's own goals or those of others..."The following Section 6.2 describes and explains how the conceptualisation of the first hypothetical matrix model was visualised.

6.2 Model 1 for Online Teaching based on a Leadership Paradigm

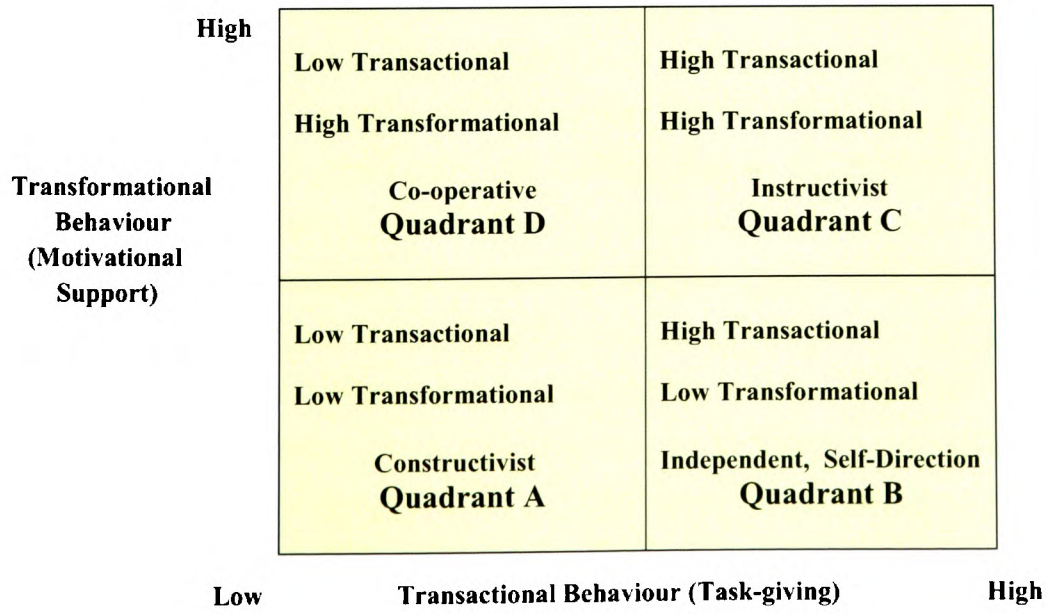
With evidence that e-moderator perceptions of what they do online is underpinned at one and the same time with two critical variables, namely task-giving (a transactional behaviour) and motivational support (a transformational behaviour) the research explored how to bring these two variables together to explain their co-existence in a virtual environment. Several ideas were reflected upon. For example, whether these two components were best presented on a linear continuum moving from transactional behaviour to transformational behaviour, in the sense that when a task is given to an e-learning group, this might be followed up with discussion and the online teacher may through feedback empower e-learners to progress further. However, this did not seem satisfactory because with differing learning preferences in levels of collaboration and knowledge construction, it was construed that there could be varying degrees of task-giving and at the same time varying degrees of motivational support. The question

continuously arising for some time was "In what way could these two variables be brought together?"

As the literature review illustrates many types of representations have been conceptualised to prescribe sound practice in virtual classrooms. These were interesting and helpful to some degree. However, during a course on Entrepreneurship the researcher came across a graphical technique, known as the Boston Matrix., to illustrate a conceptual framework underpinned by two independent components. The two components were represented by two axes at right angles where one component was represented along the horizontal axis and the other on the vertical axis. Where these two axes met, at the origin, measures were ascribed either from high to low or low to high. In this way four quadrants are discernible each with characteristics designated by the horizontal and vertical scales. What was important here was that the two variables were seen to be independent of each other, but allowing for a balance of possibilities. Immediately the question arose as to whether such a 2 x 2 matrix representation would work with the two variables (i) transactional and (ii) transformational e-moderator leadership behaviours? This notion was put to the test as shown in Figure 6.2.

The 2 x 2 matrix design in Figure 6.2 shows the variable for transactional behaviour (task-giving) along the horizontal axis with a scale from low to high and the variable for transformational behaviour (motivational support) along the vertical axis again with a scale from low to high.

Figure 6.2 Matrix Model 1 for Pedagogical Variation from e-moderator perceptions of what they do online



In this way four quadrants can be identified, characterised by four constructs namely (i) low task-giving (ii) high task-giving (iii) low motivational support and (iv) high motivational support. A combination of two of these constructs together gives rise to the four quadrants which are labelled A, B, C and D. Arriving at this stage in the research, there arose a number of challenges. The first challenge was to identify characteristic online pedagogical leadership features for each of the four quadrants, A, B, C, and D. Secondly it became evident that eliciting e-moderator behaviours from e-moderator practitioners would be an appropriate way of establishing whether there were realistically four different approaches for designing and delivering online courses, regarding task-giving and motivational support. What now follows is the challenge of brief scenarios, explaining the rationale to meet the expected outcomes of e-moderator roles and relationships in each of the four quadrants.

Quadrant A : A more likely constructivist pedagogical approach

A scenario representing Quadrant A is a student-centred, highly constructivist environment where the e-moderator is more likely to take a minor part in a discussion forum, i.e. a low profile, providing few tasks to 'spark'(Salmon, 2011:199) a discussion forum e-tivitiy, with little necessity to motivationally support e-peers. Researchers, Mazzolini and Maddison (2003) found that when online tutors intervene in a minimal way, e-learners were more likely to contribute lengthier discussion threads Wozniak (2007:214) describes this online 'invisibility' or 'ghost-in-the-wings' characteristic as being essential where resources are limited and in groups of up to 50 e-learners where she experienced an average of 30 online postings per student, i.e. a productive, collaborative situation. Using Mezirow's (1990) terminology 'Transformative Learning' is appropriately situated in this quadrant where e-moderators allow e-learners to freely and spontaneously reflect and interpret their experiences, ideas and assumptions gained through prior learning. In this quadrant there is the opportunity for a high degree of ePeer interdependence, intersubjectivity and much interaction This type of pedagogical approach is rooted in the meaning-making process that is central to constructivism, which Pallof and Pratt (1999:129) recognise as a 'major feature of the online classroom'. The e-learners are encouraged to become self-managing learning teams (Salmon, 2011:240) where the e-moderator sets up a plenary thread indicating the type of outcome required and suggests that "the first task of the groups is to decide what they have to do and who will do what to arrive at the sort of outcome to be produced". In such an environment e-learners are

considered as co-constructors of knowledge rather than just consumers of it (Bruffee, 1999).

Quadrant B: A more likely facilitative pedagogical approach

In Quadrant B, the e-Moderator acts as a 'guide-on-the-side' (Wozniak, 2007:214) providing a large variety of e-tivities and problem-solving tasks, with a minimal amount of scaffolding or motivational support. The e-learners are encouraged to continue to work independently without the necessity of intersubjectivity or interdependence. Dirkx and Smith (2007:134) recognise that there are students who experience a "profound ambivalence toward online collaborative learning, fuelled in part by the emotional dynamics associated with the forces of individuation (Boyd, 1991) and group development (Smith and Berg, 1997)." E-moderator skills in this quadrant would be developed to take on a supportive, yet an impartial approach when group members are unable to collaborate and in some cases show an inability to agree. Tensions due to mistrust may arise and individuals prefer to continue with a strong sense of self-direction and independence, rather than develop consensus-building skills. The relationship between the e-moderator and group members is as a provider of numerous authentic e-tivities, without pressurizing the members to collaborate but rather to allow member to develop their own individual ideas with a sense of ownership. If the e-moderator were to encourage collaboration, the e-learner would have to " let go of their own ego needs"(Dirkx and Smith, 2007:146).When e-moderators recognise that e-learners are highly motivated "to take responsibility for their own learning, direction and productivity...the learner's efforts become the unequivocal focus...and the teacher will fade back"(Grow, 1991:135).

Quadrant C: A more likely instructivist pedagogical approach

This may be the most difficult e-moderating environment to manage. Leadership qualities of both a high transactional nature and a high transformational nature will be needed to encourage e-learners to come online, in the first place, to stay online and to work online.
i.e. "Coming together is a beginning; staying together is progress; and working together is success" (Anonymous Quote). Salmon (2011:244-245) provides ample advice and guidance on how to understand 'lurking'. Salmon (2011, 245) suggests that potential participants "need time to become used to the online environment before insisting that they post their responses." In such situations an e-moderator can take advantage of personal emails to students who for some reason or another fail to come online, without a great deal

of encouragement from their e-moderator. "Adopting e-learning in its full potential is a transformative process that requires a long-term commitment to overcome the inevitable resistance" (Garrison and Anderson,(2003:113). Novice e-learners and e-moderators will need much more time to adjust to online e-tivities (Salmon, 2011:116). Salmon also stresses the need to use the most experienced e-moderator trained academic staff for the introduction of e-learning to inexperienced novice participants. That is to say that online e-tivities are selected as fit-for-purpose rather than force-fit activities online when they would be more suitable off-line. At this early stage of online participation an e-moderator needs to make great efforts to welcome and sustain participation from everyone. It is important "to acknowledge that high levels of anxiety and lack of confidence in some participants may mean that some individual 'hand holding' is needed" (Salmon, 2011:194). Grow (1991:126) suggests that "a good manager (*in this context e-moderator*) chooses a mix of directiveness (*in this context instructivist approach*) and personal interaction ("socioemotional support"). Leadership qualities of appropriate high levels of task-giving and motivational support are paramount to develop an e-learning community where lurkers, shirkers and novices are reluctant to engage in online learning. It is important to match an e-learner's "readiness" (ability and motivation) with an appropriate and effective e-moderating style (Grow, 1991:126). Inevitably a 24hr/7day online availability for monitoring purposes is not feasible by one e-moderator alone and as Salmon (2011:116) suggests it is important at this stage to "develop and share a process of working together in e-moderating teams and in providing cover and breaks from online commitments."

There are some instances, in which no online participation is happening. Grow (1991:129) contends that some "dependent learners need an authority figure to give them explicit directions on what to do, how to do it, and when", (i.e. teacher-centred). This is where e-moderating becomes exceedingly challenging in developing a constructivist learning environment when potential participants are used to an instructivist approach. Dirkx and Smith (2007:148) point out that "differences in beliefs and opinions seem almost insurmountable at times, leaving students to feel that they were spinning their wheels and that group meetings were largely a waste of their time". Lurkers may have been intimidated, losing their confidence to engage in e-tivities for fear of being ostracised by inconsiderate postings from their e-peers. Salmon (2011:195) suggests that e-moderators are to "deal very promptly with difficulties among participants, such as dominance, harassment and perhaps excessive lurking". Direct intervention is then needed and a more e-moderating instructivist approach required to bring about trust and stability within the

discussion forum. Hence, both a higher degree of transactional leadership in task-giving and a higher degree of transformational, motivational inspiration are recognised in Quadrant C for effective online teaching.

Quadrant D: A more likely co-operative pedagogical approach

In Quadrant D, an essential skill for an e-moderator is 'the sage on the stage' giving few tasks at a time with a great deal of motivational support, for example by scaffolding. The e-moderator recognises that e-peers are socially aware of each other online, enjoying collaboration through social banter, but need greater support in knowledge construction, from a subject expert, using smaller chunks of information to avoid 'cognitive overload'. Salmon (2011:43) recognises that "demands for help can be considerable because participants' seeking, searching and selection skills may still be low... (and that)...participants look to the e-moderator to provide direction..." Grow (1991: 127) concludes that "there is more than one way to teach well. With some exceptions, good teaching is situational – it varies in response to the learners." An e-moderator's role and relationships in Quadrant D could be said to be based on semi-dependent learners who need close monitoring for their most effective learning outcomes not only by their exchange of ideas through collaborative efforts but also by meaningful scaffolding by an experienced e-moderator. All learners may become dependent for a time when learning a new topic (Grow 1991:130). It is also recognised by Pratt (1988:168) that "there is nothing inherently demeaning or destructive in pedagogical, temporarily dependent relationships.

The above insights to the conceptualised characteristic features of e-moderator roles and relationships in the four Quadrants, namely, A, B, C, and D of Model 1 are designed to link with the conceptualised characteristic features of e-learner relationships in the four Quadrants, namely, E, F, G, and H of Model 2. These are discussed later in the chapter.

The issue as to whether this hypothetical model, diagrammatically represented as a 2x2 matrix, would stand up to testing is addressed in the next section.

6.2.1 Is the hypothetical Matrix Model 1 Testable?

I was not at all sure, at the time how to test the initial conceptual framework from e-moderator perceptions of their online roles. I wanted to find a way of eliciting what e-moderators perceive they do online. At the time grounded theory seemed attractive where

if data were to be collected from a sample of e-moderating practitioners then by an inductive methodology it might be possible to find emerging themes from which a hypothetical model were to emerge. It seemed plausible to apply personal construct psychology (Kelly, 1955) with the purpose of eliciting (i) what e-moderator perceptions of what they do online and (ii) their perceptions of what their e- learners do online. This is more fully described and explained in the next chapter, Chapter Seven, where methods of corroboration were implemented not only for Model 1 but also for Model 2 and Model 3.

6.3 Model 2: How did evidence from the Literature Review influence the Research?

Insight to research findings from the literature (Chapter Four) prompted the design of a second hypothetical conceptual framework, Model 2, for online learning. It became more and more evident from the conceptual models discussed in the literature review that online teaching and learning was predominantly based on the orthodoxy of constructivism. From the pedagogical implications emerging in the research there is strong evidence that a constructivist environment is characterised by e-learners who are comfortable with this kind of environment in the virtual classroom and who seem to be confident in knowledge construction on a highly collaborative basis, enjoying their freedom to explore ideas with e-peers and minimum intervention by the online teacher. In Goodyear's conceptualisation, learner-managed learning and learner-centred design and development (Chapter Four, Diagram 4.3) are characteristic both of Dewey's (1933) and Vygotsky's (1978) social constructivism and Piaget's (1951) individual constructivism (Chapter Three, Chart 3.2). Another example of a theoretical framework encouraging online socialization with a view to collaborative knowledge construction is given by Salmon's (2000) Five-Stage Model. Here Salmon (2000) advocates a constructivist approach in e-moderating (Chapter Four, Diagram 4.4).There is evidence also that a shift from an instructivist environment to a constructivist environment encourages greater collaboration (Moule, 2007) in group work problem-solving activities (Chapter Four, Diagram 4.7). In their conceptual framework of a community of enquiry, Garrison, Anderson and Archer (2002) underpin online learning with an essential online social interaction (social presence) for cognitive development (cognitive presence). The nature of this learning environment gives evidence for collaborative knowledge construction. Teacher presence is viewed as an essential part of learning. It may be argued that in a highly constructivist environment, teacher presence is less than in a less constructivist virtual classroom where teacher presence becomes more

evident. Bass and Elmendorf (2009) advocate a social pedagogical model, where the social construction of knowledge echoes hints of Dewey's (1933) and Vygotsky's (1978) social constructivism. (Chapter Four, Diagram 4.10).

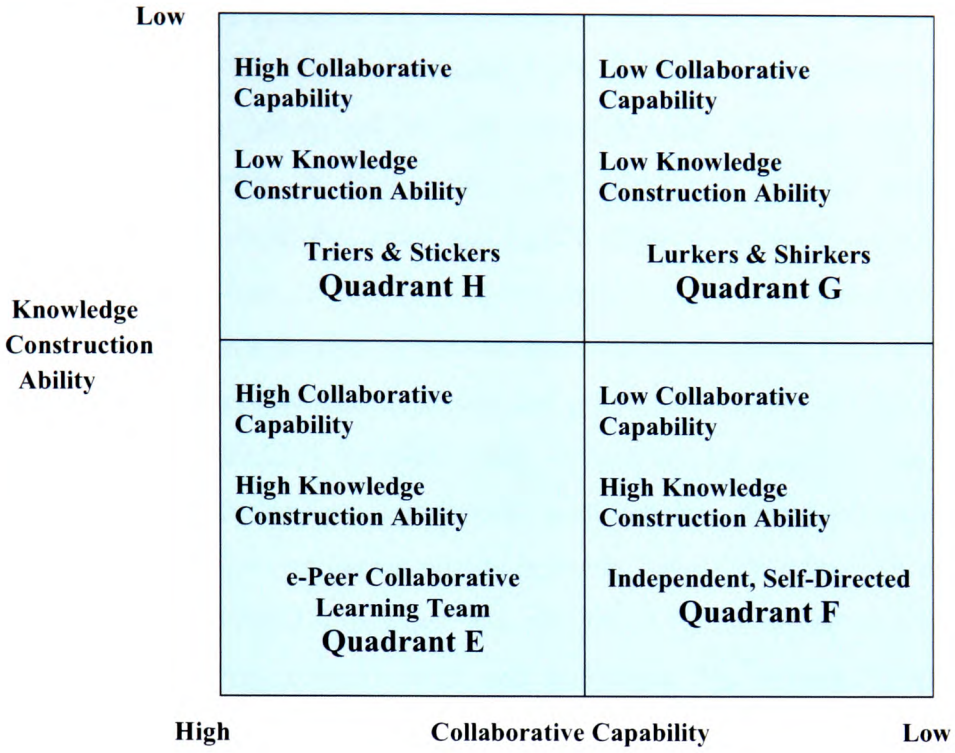
In such a constructivist learning environment two significant assumptions are made; firstly, e-learner collaboration exists and secondly, that e-learner knowledge construction occurs amongst e-peers. Reflecting on these two assumptions, it was envisaged, however, that there is a balance of circumstances to be considered, namely that there are e-learners with varying degrees of collaborative capability and varying degrees of knowledge construction ability. In the extreme case, there may be e-learners with very poor collaborative skills, yet who are very able to construct knowledge, and there may be e-learners who have very good collaborative skills by socialising, but are not so good in knowledge construction. By reflecting on these issues a second hypothetical model for online learning was visualised as described and explained in the next section.

6.4 Model 2 for Online Learning based on Evidence from Extensive Research Literature

The second hypothetical model for online learning, Model 2, was based on two components, akin to a constructivist paradigm, namely (i) collaborative capability and (ii) knowledge construction ability as shown in Diagram 6.3 below. At this point it is really difficult to ascertain whether it was an inductive process that led to this conceptual framework because the literature review influenced my thinking and so I realise, now with hindsight that. it was a great challenge to come to the data which was elicited from e-moderator perceptions of their online roles, (discussed in the next chapter) with a 'fresh' approach, putting aside those insights which I had previously gained.

Model 2, was based on a design, similar to the first hypothetical Model 1, which was again underpinned by two main components that could be represented diagrammatically by a 2 x 2 matrix. The component for collaborative capability was placed along the horizontal axis and the component for knowledge construction ability along the vertical axis. The scaling however differs here to that in the first hypothetical Model 1. In this hypothetical Model 2, a scale is designated, starting at the origin, moving from high to low for both axes, as shown in Diagram 6.3.

Figure 6.3 Matrix Model 2 for Pedagogical Variation from e-moderator perceptions of what e-learners are able to do online



What now follows are four brief scenarios, explaining the rationale to meet the expected outcomes of e-learner relationships in each of the four quadrants.

Quadrant E: A more likely environment for e-Peer collaborative Learning Team(s)

In Quadrant E, members constitute an e-learning group which is more likely to be collaborative than non-collaborative; members are likely to show strong capabilities of constructing knowledge and sharing their individual ideas and expertise in developing a team approach rather than working independently at individual levels. Salmon (2011:240-241) recommends that e-learners should be encouraged to form self-managing groups and that this is the kind of environment is to be aimed for in online courses. In this environment e-learners will not want to ask the e-moderator what to do but rather explicitly inform the e-moderator *what* they want to do, by *whom, when and how.* Grow (1991:134) similarly expresses this notion, stating that "self-directed learners (in this case *self-managing groups)* set their own goals and standards - with or without the help of experts. They use experts, institutions, and other resources to pursue these goals." Salmon (2011:53) contends that confident, critical thinking participants may "resent interference and wish to start conferences of their own choosing, perhaps asking the designated e-moderators to

withdraw." What is significantly characteristic of the behaviours of e-learners in this quadrant is that a culture of intimacy develops where members can open themselves up to another as well as "being receptive to the otherness and difference of group members (Dirkx and Smith, 2007:145). These e-learners are able to bring their own problem-solving issues (subjectivity) to the group and are also willing to allow these personal issues "to change and be re-defined as they work with others on broader group issues (intersubjectivity) as discussed by Dirkx and Smith, (2007:145). Also, by cultivating a culture of intimacy and trust, e-learners become more comfortable and interdependent upon one another "through a process of individuation within the group i.e. a member sees himself or herself and other members as distinct but interrelated beings" (Dirkx and Smith, 2007:145). Wozniak (2007:221) concludes that "if learners are carefully prepared and guided through their early online experiences, asynchronous discussion activities can achieve group collaboration and higher quality learning." The higher quality of learning, according to Laurillard (1994:21) includes "the *adaptation* by the teacher to the learner's world, through feedback on learner's work and discussion. The learner *reflects* on that feedback. Reflection takes time and effort. If the teacher gives little time for reflection, they fail in providing the opportunity for the learners to construct new meanings in relation to the existing meanings, leaving the learning process incomplete." In Quadrant E it is likely that e-learners are co-responsible with the e-moderator (or sometimes without) for the well-being of their online learning community and may "feel strongly that the instructor's presence, especially at the start of online courses is important to establishing a sound sense of group community (Conrad, 2007:199). In this light the e-learning community expects an e-moderator to play a key role in group formation at the "forming" stage of group dynamics (Tuckman, 1965). This quadrant, therefore, accommodates those e-learners with high levels of knowledge construction ability through high levels of collaboration, which according to numerous researchers (Brookfield, 1987; Burge, 1988; Garrison, 1993; Lauzon, 1992; Morrison, 2004) manifests itself in deep learning. That is to say that e-learners ascribed to this quadrant do not passively "accept knowledge as it is presented to them," (Morrison, 2007:107) but alternatively develop skills to critically examine and construct knowledge, collaboratively, based on their own experiences and previous knowledge.

Quadrant F: A more likely e-learning environment where members are independent, self directed individuals

Quadrant F is characterised by e-learners who are more likely to be independent, highly motivated and self-directed, taking responsibility for their own learning. These e-learners take advantage of the learning platform for the numerous electronic resources that are generally easily accessible and for the guidance of an experienced online tutor with subject expertise who provides a choice of numerous e-tivities. Roberts and McInnerney (2007:257) contend that "on occasion students are actively hostile to group work", preferring to work on their own and some students remarking that they find it a waste of time to communicate with their e-peers in the group because they perceive them to be less capable than themselves. Students who are inclined to think like this "thrive in an atmosphere of autonomy" (Grow, 1991:134). As self-directed e-learners become more familiar with online e-tivities, their need for independence will be carefully monitored by a skilful e-moderator, to the point of leaving an e-learner to explore different ways of problem-solving; such an e-moderator, in Quadrant F "will fade back, so that the learner's own efforts become the unequivocal focus" (Grow, 1991:135). Whilst Tuckman (1965) postulates five stages in the development of group dynamics (i.e. forming, storming, norming, performing and adjourning), Quadrant F e-learners are likely to refrain from collaborative behaviour due to their strong belief in working on an individual basis rather than negotiating meanings and knowledge construction through consensus based on shared experiences and expertise. The willingness of e-learners to accept help from an online teacher when requested is a likely characteristic of e-learners in this environment, without the need for excessive motivational support or scaffolding.

Quadrant G: A more likely environment for Lurkers/inexperienced Novices and Shirkers

In Quadrant G, e-learners are typically absent, temporarily or for longer periods, from contributing on the learning platform. Salmon (2011:244) recognises that "there are many reasons for participants to log on but not contribute." The eight reasons Salmon gives are listed below:

- Uncomfortable in 'public'
- Learning about the group
- Building an online identity

- Fear of persistence of messages
- Communication overload
- Not necessary to post
- Group characteristics
- Personal characteristics.

(Adapted from Bax and Pegrum (2009))

A comparable list may be drawn up from Roberts and McInnerney (2007:257) as follows:

- Student antipathy to group work
- The selection of the groups
- A lack of essential group work skills
- The free-rider/ free loader
- Possible inequalities of student abilities
- The withdrawal of group members
- The assessment of individuals within groups.

Taking the above points into consideration, lurkers are dependent on continuous support from skilful e-moderating practitioners; firstly to feel comfortable in coming online and secondly, to gain confidence that their online contributions are valued by e-peers and e-moderator alike. Personal emails become effective means of communication to encourage participation, and because Quadrant G e-learners are reluctant to collaborate with e-peers due to their lack of confidence, these e-learners should be given as much encouragement as possible with a number of suitable e-tivities with appropriate 'sparks'; these e-tivities could also be emailed personally. A discussion forum with skilfully woven contributions in clearly marked threads is often less confusing and more attractive than a mass of postings. This means that summarizing and archiving become important activities for e-moderators. Some e-peers may dislike the way in which lurkers use archived resources and see them as 'the silent thief' (Salmon, 2011:245) by using what others have contributed without contributing themselves. 'Shirkers' may also characterise Quadrant G e-learners who use avoidance measures by not exchanging their ideas with e-peers, being also reluctant to take advantage of the e-learning platform. Much of their learning occurs off-line with very little evidence of their logging-on; even when they agree to log on, shirkers refrain from doing so. First-time users of an online discussion forum, i.e. novices, may also need a great deal of encouragement and would be found in Quadrant G. They may "complain at every opportunity that online work is irrelevant or too time consuming ...(and)...may perceive

working online with others as disruptive to their learning"(Salmon, 2011:243). These e-learners need strong pedagogical leadership qualities in an online teacher i.e. both transactional and transformational to bring about a positive attitude to the advantages of e-learning in asynchronous discussion forums.

Quadrant H: A more likely e-learning environment for Triers and Stickers

In Quadrant H, e-learners are more likely to be highly collaborative in their own way, mainly collaborating in a good humoured way i.e. social banter, rather than developing new knowledge amongst themselves. Their knowledge construction tends to be weak and therefore a skilful e-moderator will use appropriate scaffolding with a great deal of encouragement and fewer e-tivities to give e-learners in Quadrant H more time to reflect. A conversational approach (Laurillard, 2002) with these e-peers would be the most effective way to move these e-peers from surface or shallow learning (i.e. memorising and simple recall of facts) to deep learning (critical thinking and constructing knowledge based on previous experiences and previous knowledge). "Many learners at this stage of development (transition) depend on teachers to make decisions they themselves will later learn to make" (Grow, 1991:130). The 'triers' and 'stickers' in Quadrant H are more likely to have determination and courage to pursue their learning goals, in small steps (i.e. with fewer tasks) and with greater amounts of empowerment through-moderator scaffolding. Salmon (2011:196) stresses the importance of weaving and summarising by declaring that e-moderators should "be prepared to value every participant's contribution but weave, weave, weave, summarize, summarize, summarize." Hence weaving and summarizing are seen to be central to the facilitating role of an effective e-moderator, particularly with e-learners in Quadrant H.

The above four descriptions and explanations of 'life' in Quadrants E, F, G, and H have been presented to provide insight to the reciprocal nature of how e-learners perceive online teaching and how e-moderators respond to online learning. It is challenging to give the e-learners' perspectives without incorporating to some extent the roles and relationships of their e-moderators.

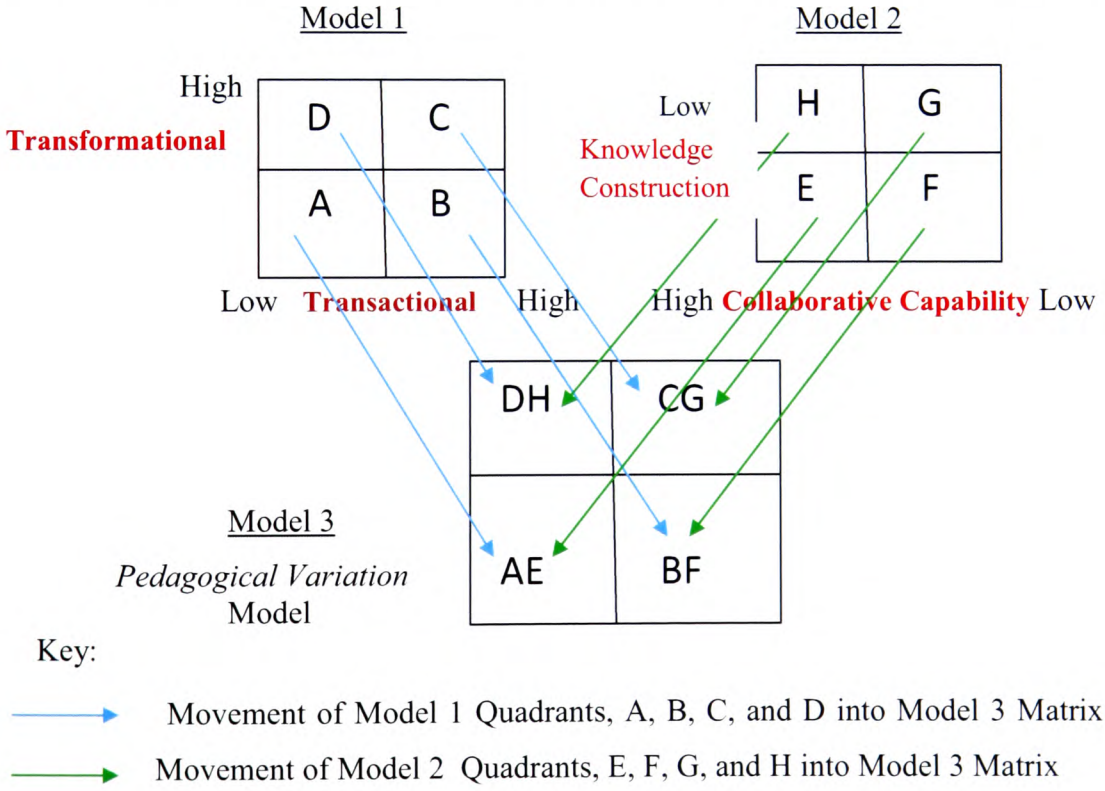
Once this second hypothetical Model 2 was created, there was the question as to whether merging this hypothetical Model 2 with the first hypothetical Model, Model 1, might

develop a third hypothetical model illustrating the two perspectives of online (i) teaching (i.e. from e-moderator perception of what they are able do online) and (ii) learning (i.e. from e-moderator perception of what e-learners are able to do online). When the hypothetical Model 1 was merged with hypothetical Model 2, a critical investigation was carried out on the emerging hypothetical Model 3 to see if it made any sense. This is inquiry is described in the next section.

6.5 Model 3 for Pedagogical Variation in online Teaching and Learning A merger of Model 1 and Model 2

When the two hypothetical models were merged, i.e. hypothetical Matrix Model 1 and hypothetical Matrix Model 2, as shown in Diagram 6.4, the third model, Model 3, the *Pedagogical Variation* Model was created.

Figure 6.4 Formation of Model 3: Quadrants in Model 1 merging with Quadrants in Model 2



The outcome, the final, third conceptual model, the *Pedagogical Variation* Model, for online teaching and learning proved to be invaluable. A diagrammatic representation for the final Model 3 for *Pedagogical Variation* is shown in Diagram 6.5, with the relevant four descriptors for each of the four Quadrants AE, BF, CG and DH.

Diagram 6.5 Matrix Model 3 for *Pedagogical Variation* from e-moderator Perceptions of what they do and what e-learners are able to do online (Merging Hypothetical Models 1 and 2)

Low Transactional **High Transformational** **High Collaborative capability** **Low Knowledge Construction ability** **Quadrant DH**	**High Transactional** **High Transformational** **Low Collaborative capability** **Low Knowledge Construction ability** **Quadrant CG**
Low Transactional **Low Transformational** **High Collaborative capability** **High Knowledge Construction ability** **Quadrant AE**	**High Transactional** **Low Transformational** **Low Collaborative capability** **High Knowledge Construction ability** **Quadrant BF**

To summarise the outcomes in this hypothetical Model 3, so as to be able to move on to the ways in which a strategy was developed to test the three hypothetical models, the listing below gives an insight to characteristic online learning and teaching relationships within each of the four emerging quadrants.

(i) Quadrant AE

In this quadrant an effective e-moderator recognises the eagerness and keenness of e-learners in generating their own ideas through critical thinking and exchanging their experiences. Only a few e-tivities will be needed to 'spark' interchange for e-peers' contributions to a topic in a specific threaded debate or problem-solving activity. E-peers may prefer to collaborate with one another rather than to have continuous feedback from their e-moderator. In some instances, an e-moderator might need to 'fade away'.

According to Salmon (2012) the most effective ratio of e-learners: e-learner posting: e-moderator responses is 15: 44: 3. So in an online cohort of 30 e-learners there would be 88 postings to any one thread and 6 e-moderator responses. Group size is also an important consideration in a highly constructivist environment where an experienced e-moderator would be less likely to provide numerous e-

tivities, giving e-learners the freedom of self-autonomy, interdependence and intersubjectivity to use their skills for developing a self-managing community of practice (Wenger, 1998, 2000).

(ii) Quadrant BF

In this quadrant the e-learners are likely to be highly motivated, eager and keen to develop their own ideas, but the difference of these e-learners from those in Quadrant AE is that they prefer to work on their own rather than collaborate with their e-peers, in contrast to e-learners in Quadrant AE who enjoy high levels of e-peer to e-peer interaction. An effective e-moderator in Quadrant BF is likely to recognise the individualistic nature of e-peers, their independent and self-directed, non-intersubjective way of problem-solving. E-peers will not necessarily be encouraged to form collaborative groups, as this may 'alarm' those who may not have the necessary skills for collaborative consensus-building and who may drop out if collaboration is imposed.

Since these Quadrant BF e-learners are eager to make progress from one topic to another with their self-autonomy, they are able to tackle numerous e-tivities presented by an experienced e-moderator and are comfortable in doing so in contrast to Quadrant AE e-learners who are capable of generating their own ideas collaboratively, sometimes in preference to taking on e-tivities presented to them. The transactional leadership (task-giving) qualities of a Quadrant BF e-moderator will become more appreciated by the e-learning group than transformational leadership (motivating) qualities as these Quadrant BF e-learners already possess high levels of self-motivation.

Quadrant CG

In this quadrant there is a distinct lack of participation for some reason or another. A Quadrant CG e-moderator will need to adopt strong leadership qualities both transactionally in selecting numerous, appropriate e-tivities to 'spark' ideas for potential online learners as

well as to give a lot of emotional support with inspirational motivation characteristic of transformational leadership. A 'spark' maybe "a statement, picture, website, resource, audio or video file inserted to attract the user to the e-tivity and generate interest" (Armellini and Aiyegbayo, 2010:925). The inclusion of such 'sparks' are invaluable in fostering a commitment to engage disenchanted e-learners in online participation. Salmon (2011:38) contends that "joining in with a new educational experience (or any novel situation) inevitably creates some confusion and especially so for participants coming from different cultural and language backgrounds from either the majority of the group or the provider of the learning experience." Quadrant CG e-learners are likely to prefer a more directed approach to their learning (i.e. instructivist). In some cultures for example Asian students, "there can be the expectation that the teacher will 'tell' and the student will learn what the teacher says" (Salmon, 2011:213). It was found by Armellini and Aiyegbayo (2010:932) during a Carpe Diem training session, that "the tutors' online participation and e-moderating skills were key to learner engagement with e-tivities."

If students are expected to ask a question, which is not generally an expected, e.g. in traditional Chinese cultures, online students may need to be, sensitively invited to try asking questions to avoid resentment on the part of the e-learners.. Researchers, (Handy, 1995; Lawless and Allen, 2004) conclude that for some people online collaboration is stressful. Palmer et al. (2003:15) define stress when "the perceived pressure exceeds your perceived ability to cope."One particular factor contributing to stress online is that of 'lack of trust' (Lawless and Allen, 2004:122) where an e-learner experiences a sense of mistrust or lack of confidence in the competence of their e-peers and/or their e-moderator. In contrast, Bax and Pegrum (2009) recognise the anxieties newcomers face when attempting to join an online discussion forum, due to a lack of confidence in themselves to express their views openly in 'public' (i.e. feeling vulnerable to criticism by others).

Quadrant CG e-moderators needs to show "sensitivity to online relationships and communication, (and) be able to value diversity with cultural sensitivity... (and)...be able to establish an online identity as e-moderator" (Salmon, 2011:107). The e-learners in Quadrant CG are likely to be lurking, shirking or inexperienced novices (first time users) who are more likely to respond to personal emails, initially, that encourage online participations through gradual reflective experimentation In effect this means that e-moderators with strong pedagogical leadership qualities are more likely to create the beginnings of an online community of e-learners by establishing a social presence in a secure environment "in making students feel welcome and giving them a sense of belonging" (Garrison and Anderson, 2007:54).

(iii) Quadrant DH

Quadrant DH is characterised by e-learners who enjoy a high level of social presence online. Garrison, Anderson and Archer (2000:94) define social presence as "the ability of participants in a community of inquiry to project themselves socially and emotionally as 'real people' (i.e. their full personality), through the medium of communication being used." However, Garrison and Anderson (2005:53) contend that "too much social presence may inhibit disagreement and encourage surface comments and social banter." This, coupled with e-learners' weakness in knowledge creation in this quadrant, will be recognised by an experienced e-moderator to require a delicate balance of task-giving and inspirational motivation (i.e. transformational leadership qualities). An e-moderator in this quadrant is likely to offer "tips and strategies for dealing with information overload" (Salmon, 2012:198) and a good deal of scaffolding.

Laurillard (1994:19) also identifies the significance of discussion and interaction during the online learning process as well as adaptation and reflection. This requires "adaptation by the e-moderator of the

learner's world through feedback on learner's work and discussion" (Gulati, 2004:3). The e-learner then reflects on the teacher's feedback to make meaningful insights for knowledge creation which is shared amongst e-peers in the group. Quadrant DH e-peers struggle without their e-moderator's pedagogical leadership as contended by Garrisson and Archer (2005:86) "it is the responsibility of the teacher to provide intellectual and pedagogical leadership."

6.6 The Dynamic Nature of the Hypothetical Model for Pedagogical Variation

In this section the dynamic nature of the hypothetical *Pedagogical Variation* Model is discussed. In Model 3 there is an inbuilt flexibility, due to its underlying situational nature. This dynamic aspect is an important characteristic. For example, a Quadrant CG e-moderator, recognising that an e-learner has gained confidence, by the 'sparks' in the e-tivities, to come online to share their experiences, may invite the e-learner, through a personal email, to join e-learners in Quadrant DH who enjoy socialising and vice versa. A Quadrant DH e-moderator, likewise, via personal emails, may suggest to a member, that they might find it more comfortable in Quadrant CG where the e-moderator is 'holding hands' with less confident online learners and giving a number of initial 'sparks' to develop interest and ideas through a more directed learning environment. Salmon (2011:195) hints that e-moderators should be able to "provide a variety of forums to suit different student needs."

Quadrant BF, e-learners who after enjoying their independent approach to creating new ideas, but initially hesitant to share them with e-peers in Quadrant BF, may be encouraged by their e-moderator, by personal emails, to try working alongside collaborative members in Quadrant AE and vice versa. That is to say, a Quadrant AE e-moderator may observe that some e-learners are flagging and struggling with new, unfamiliar topics and are having difficulties in coping with the numerous e-tivities generated by the group. An intuitive e-moderator may then invite such a member of the group, through a personal email, to join e-learners in Quadrant DH and vice versa. An AE e-moderator may also recognise that a member is becoming too dominant and self-directed and therefore may politely invite the e-learner to join more appropriate group e.g. Independent, self-directed e-learners in Quadrant BF.

In this way the development of the e-learner shifts the emphasis on the learning environment which best suits his/her progress (Salmon, 2012:195). Whereas before, a student may be weak in knowledge construction, after experiencing learning in the situation conceptualised in Quadrant DH, their knowledge construction increases and the situation conceptualised in AE may suit him/her more beneficially. This now means that the dynamics of the *Pedagogical Variation* Model can change the dependency and independency of variables, i.e. those variables that were independent (collaborative capability and knowledge construction ability) become dependent and those variables that were independent (transactional behaviour and transformational behaviour) from the *e-learner perspective.*

Grow (1991:140) describes the situational nature of teaching as follows:-"What is 'good teaching' for one student in one stage of development may not be 'good teaching' for another student or even the same student at a different stage of development. Good teaching is situational, yet it promotes the long-term development of the student". This describes the situational nature of the *Pedagogical Variation* Model. "Nearly any teacher can teach in more than one style" Grow (1991:141).

The *Pedagogical Variation* Model provides insights to the differing situations e-moderators and e-learners find themselves. It should be a guide to prevent the mismatch of e-moderating styles with e-learner preferences in online learning contexts. For example if Quadrant AE highly collaborative e-learners, who enjoy the freedom to generate their own ideas find themselves in a Quadrant BF situation with e-learners who prefer to work independently and non-intersubjectively and the e-moderator provides continuous unwanted feedback then tensions arise where positive e-learning experiences diminish.

A summary, to show how this dynamic nature of the *Pedagogical Variation* Model serves both e-moderators and e-learners in two respects, follows below:

6.6.1 From an e-moderator Perspective

In the *Pedagogical Variation* Model, one of the underlying assumptions is that online teaching is situational. An e-moderator's online behaviour is dependent on e-learner behaviour where the independent variable is e-learner behaviour and the dependent variable is online teacher behaviour. This direct variation can be represented as follows:

Online teacher behaviour α e-learner behaviour

In this situation an online teacher bases his/her choices of transactional and transformational leadership behaviours on his/her perceptions of e-learner collaborative capability and knowledge construction ability.

6.6.2 From an e-learner Perspective

On the other hand, in the *Pedagogical Variation* Model, learning may also become situational. That is to say an e-learner's online behaviour varies according to e-moderator behaviours online (i.e. e-learner behaviour is dependent on e-moderator behaviour where the independent variable is e-moderator behaviour and the dependent variable is e-learner behaviour. This direct variation can be represented as follows:

e-learner behaviour α e-moderator behaviour

From this perspective an e-learner bases his/her online collaborative capability and knowledge construction ability on his/her perceptions of an online teacher's transactional and transformational behaviours. In this way an e-learner has a choice of deciding which e-learning environment would suit him/her best (i.e. Quadrants AE, BF, CG and DH).

It is suggested by Greener(2008:270) that good role-modelling by e-moderators, for example "how to start new threads and to respond to others and choosing appropriate threads to keep the board tidy" will encourage e-learners to develop effective online learning skills by imitation. This shows a reciprocal relationship that e-moderators adapt their teaching to e-learner behaviour and e-learner behaviours are adaptable to e-moderator online behaviour. It is also important for e-moderators to role-model how to ask questions, respond to new ideas and to provide examples of how to interact with others online, especially when e-learner tendencies to lurk are observed (Salmon, 2011).

The above explanation of how the variables can act in both directions shows "reciprocal causation" (Blalock and Blalock, 1970:27). In this investigation, it was decided to focus on the e-moderator perspective. Alternatively, to focus on the e-learner perspective would make an interesting exploratory study for future research. In the next section the limitations of this exploratory study are discussed.

Before moving on to discussing how empirical data was collected (Chapter 7) to corroborate the three hypothetical models, the process of conceptualizing the three hypothetical models is summarised below.

6.7 Summary

Insights to the way in which the three hypothetical models were conceptualised have been described in this chapter. The first model was based on the assumptions drawn from a leadership paradigm (Avolio, Bass and Jung, 1999). Two leadership factors, namely transactional leadership behaviour (task-giving) and transformational leadership behaviour (motivational support/empowerment) were identified and used in a 2 x 2 matrix. These two variables were given a scale of low to high on both the horizontal and vertical axes.

A second model was based on the assumptions drawn from a social constructivist paradigm (Dewey, 1933; Vygotsky, 1978). Two factors, namely collaborative capability (e.g. interacting with e-peers and e-moderator) and knowledge construction ability (e.g. ability to problem-solve on social and individual levels) were identified and used in a 2 x 2 matrix. These two variables were given a scale of high to low on both the horizontzl and vertical axes.

By combining the two hypothetical models for online teaching and learning, a third model for *Pedagogical Variation* emerged. These three hypothetical models were testable. Their corroboration is described and explained in Chapter Eight and put to the test of falsification in Chapter Ten.

In the next chapter an account is given of the methods used to elicit e-moderator perceptions of their online roles. in asynchronous discussion forums.

Chapter Seven

Adapting Personal Construct Psychology to elicit e-Moderator Perceptions of their online Roles and Relationships

7.0 Methodology for Data Gathering: Background to Empirical Study 1

In the previous chapter, the first research objective of the research design was discussed, i.e.

1. To conceptualize and develop a model for online teaching and learning.

This chapter deals specifically with the methodology selected for the collection of empirical data i.e. perceptions of e-moderators about their online roles and relationships as stated in the second research objective, namely:

2. To elicit e-moderator perceptions of their online roles and relationships in asynchronous discussion forums to corroborate the emerging conceptual model.

The next chapter, Chapter Eight, deals with the methodology implemented for the corroborative data analysis of the hypothetical framework for online teaching which was conceptualized in Chapter Six with the empirical data collected.

The selection and development of an appropriate methodology for data collection became a focal point in the research design after the conceptualisation of the three hypothetical models.

The aim in this phase of the research was to find out from e-moderating practitioners themselves, what it is that creates an effective online learning environment. In addition the research attempted to illuminate how e-moderators perceive how they are best able to provide a learning environment conducive to sound learning outcomes.

Megarry (1989:50) states that "Knowledge is not merely a collection of facts. Although we may be able to memorise isolated undigested facts for a short while at least, meaningful learning demands that we internalise the information: we break it down, digest it and locate it in our pre-existing, highly complex web of interconnected knowledge and ideas, building fresh links and restructuring old ones." This quote summarises the quintessence of investigative research whereby data is collected in its raw state, '*digested and internalised*' and then becomes converted into interwoven threads of meaning with the emergence of *fresh* new landscape(s). This section relates to possible methodologies to elicit e-moderator perceptions of their online roles in an attempt to uncover their reality of e-learning in virtual classrooms. Laurillard (1993) signals that the face-to-face interaction of students with their teachers is one of the most important elements of learning. Similarly, this may be true for

researchers when conducting face-to-face (personal) interviews to elicit participants' viewpoints, also from observed body language. This is a relevant observation when adopting the methodology of personal construct psychology.

Some educational researchers (Pope and Keen, 1981; Turner 2004) are seeking new approaches to research, recognising that past educational research has been conducted on too narrow a base. In her book *'When Giants Learn to Dance'*, Kanter (1990:10) emphasises how a paradigm shift may underpin a powerful influence to change "older larger companies, corporate giants, not by creative destruction but by allowing them to model themselves into new forms, accelerating innovation within a corporate structure". Some observers argue that older companies with deep pockets for research and development must die off, like dinosaurs, to be succeeded by a new breed better adapted to its environment, in much the same process that has characterised biological evolution. The question, whether such a paradigm shift can make the difference between success and failure in such a revolutionary environment with ever rapidly increasing technological adaptations, is well answered by Kanter, "I believe it can...if we understand the shape of things to come...and use the present to explore the future."

Discussing these issues in relation to research on teaching (comparable to e-moderating, online), Snow (1974:288-9) suggests that educational researchers should be concerned with "...adapting a methodology to match the complexity of students and situations in schools...Hopefully in future programmes of research, alternative kinds of designs will be used and various hybrids will be invented so that the advantages and disadvantages of each can be counter-balanced and more clearly understood..."

7.1 Selecting a Methodology: Personal Construct Psychology

Casey (2004:22) concludes that "many teachers do not possess a vocabulary for articulating and sharing their pedagogic strategies and designs with others, particularly beyond their cognate discipline area." Casey recognises that it is difficult for researchers to find out how teachers teach because teachers are unable to explain their habitual teaching expertise i.e. tacit knowledge (Minstrell, 1999; Tsoukas, 2002). Bell and Cowie (1999:200) also recollect that "teachers' knowledge is often tacit knowledge". Ideas were borrowed from personal construct psychology for the research methodology, to "bring to the surface...how they (expert teachers) do their job." (Shim and Roth, 2006:215). These researchers conclude that "through the formation of tacit knowledge an expert worker, for example will focus on tools when s/he is in the process of learning the tools; will become unconscious of the tools, through practice and repetition, and will eventually uncritically accept the tools. Through

this process, the knower becomes unable to articulate the essence of his/her tacit knowledge." (Shim and Roth, 2006:218).

The tools, in the case of an online teacher, can be viewed as the asynchronous discussion forum and the hardware and software infrastructure which allows connectivity with e-learners at any time and any place. It is suggested that through their tacit knowledge, online teachers with continuous practice in ALNs will begin to develop skills which become almost sub-consciously automatic so they are unable to explain how they do what they do online. A methodology was needed which would elicit online practices (behaviours) which e-moderators perceive to contribute to their online roles and relationships. Personal Construct Psychology was seen as a means of unleashing perceptions of unconscious and repetitive use of teaching strategies from e-moderating practitioners and tacit knowledge about their e-learners.

From Snow's (1974) suggestion, of adapting a suitable methodology, ideas were borrowed from Personal Construct Psychology methodology, i.e. a repertory grid technique, evolving from the work of George Kelly (1955). Aspects of Personal Construct Psychology seem to have a direct bearing on concerns in educational research (Ravenette, 1999), namely viewing the perspective of the personal as being central to an alternative investigative process. Blumer (1966:542), writing on educational research, suggests that "...since action is forged out of the actor out of what he perceives, interprets and judges, one would have... to take the role of the actor and see his world from his standpoint..."

This emphasis on the person as meaning-maker is central to Kelly's position. In order to understand a person's behaviour, it is necessary to know how s/he construes their particular position. Kelly argues that persons differ from each other in their construction of events (Appendix A2: individuality corollary). Kelly also focuses on the notion that a person may construe their environment in a number of different ways depending on their imagination and the courageousness of their experimentation. Kelly (1969:25) argues that a person is not stimulus-bound but that a person may well be bound by their construal of the world. "Man is nothing other than what he makes of himself". Since the research aim is to find out what and how e-moderators teach online, it seems that an approach using Personal Construct Psychology would be useful.

Kelly suggests that there emerges the open question for a person not whether reality exists or not, but what sense he can make of it. From this stance, even the most highly developed scientific knowledge can be subject to human reconstruction. It might even be said that all theories, including research methodologies, are man-made hypotheses which may fit all the

known facts at any particular time, but may eventually be found wanting in some unforeseeable respect and be "replaced by a better theory"(Popper, 2002:10).

Kuhn (1970) and Popper (1970), like Kelly (1969) are both arguing for the relative nature of knowledge. In recent years this relativity of knowledge, (Turner 2004) has become a major concern of educationalists and sociologists in particular The words of Postman and Weingartner (1971) echo recent views on the sociology of knowledge, emphasizing man's active construction of experiences that offers a clear challenge to the static analytic conception of knowledge.

7.2 Innovative Research Approach: Wrestling with the Elements

A bold decision was taken to adapt a methodology based on Personal Construct Psychology (Kelly, 1955:46), because the model underlying Personal Construct Psychology is explicitly the idea of *'every man his own scientist'*.(p.46) The *Fundamental Postulate* of Kelly's psychology of personal constructs states that "a person's processes are psychologically channelized by the way in which s/he anticipates events."

Effective online tutors, e-moderators, working in virtual classrooms construe ways and means of capturing the imagination, curiosity and creativity within e-learning communities by embracing significantly innovative pedagogical perspectives (Berge,1995). It is these perceived personal constructs that this research aimed to identify in relation to e-moderator perceptions of their online role(s) and relationships.

The design of the repertory grid involved a general planning phase that was underpinned by the second research objective: to investigate e-moderator perceptions of their online role(s) and relationships. An advantage, for the purposes of the research was that the repertory grid technique was not completely standardized *per se* like many other psychological research tools because it had to be adapted to the type of assessment to be carried out with the focus on each of the research participant's unique ways of construing their world and behaviours therein. Basically a repertory grid consists of:

(a) a series of *elements* that are representative of the content area under study;

(b) a set of *personal constructs* that the research participant uses to compare and contrast these elements;

(c) a *rating system* that evaluates the elements based on a bipolar arrangement of each construct.

As a result, the respective parameters that were set in the design phase of the grid assessment were the selection of elements and constructs, the rating system to be used and the number of grids to be administered.

As the research investigation progressed, a greater in-depth understanding of Kellian Personal Construct Psychology was gained and its practical application for the study became more

evident. Several issues arose regarding (i) the purposes of the elements (ii) where elements come from (iii) personal v. provided (supplied) elements and (iv) the wording of elements. The following sections attempt to clarify some problematic issues.

By definition Elements are "things or events which are abstracted by a person's use of a construct. In some systems they are called objects." (Fransella, 2003:456)

7.2.1 The purposes of Elements

Fransella, Bell and Bannister (2004) open up a debate as to whether elements exist independently of constructs or whether in fact elements are also constructs. To be able to answer this issue, it was noted that Kelly (1955/1991), himself may be a little vague about such an issue. Kelly (1955:12) concludes that "a person is not necessarily articulate about the constructions he places upon the world. Some of his constructions are not symbolised by words; he can express them only in pantomime. Even the elements which are construed may have no verbal handles by which they can be manipulated, and the person finds himself responding to them with speechless impulses." This seems to describe tacit knowledge about how things are done through experience.

Kelly also looks at freewill and determinism in the logical argument that Kelly brings to his methodology. Kelly (1955:20) explains that "the relation established by a construct or a construction system over its subordinate elements is deterministic. In this sense the tendency to subordinate constitutes determinism."

There are two very important points to be made here. Firstly determinism, used in Kelly's explanation, underpins the control that a construct has over its subordinate elements and secondly, the freewill/freedom characterising the independent characteristics of those elements, is in contrast to the superordinate constructs.

The debate, fired further by Bannister and Mair (1968) indicates that Kelly's Organisation Corollary points to the fact that construction systems are hierarchical, with constructs standing to each other in what he terms subordinate (i.e. elements) and superordinate (constructs) relationships. This also points to the construing or elicitation of both subordinate (elements) and superordinate (constructs) construction systems.

7.2.2 Elements – Where do they come from?

In his seminal work Kelly suggested (supplied) 24 role titles for his Role Construct Repertory Grid (the Rep Test) from which all forms of repertory grid as we know it today evolved (Fransella, Bell and Bannister, 2004). An important decision that cropped up in the initial stages of the research was to decide whether to elicit elements or not. If not then it may be possible to negotiate and supply elements. Pope and Denicolo (1993) suggest that within constructivist research a diversity of approaches may be seen to be used depending on the

purpose of the research. Pope and Denicolo (1993:531) conclude that their "own approach is, where possible to use free elicitation of elements if appropriate. This is consistent with the notion that the selection of the element set itself gives an insight into the person's definition of the universe of discourse under consideration."

Whilst Pope and Denicolo (1993) regard the free elicitation of elements by participants, other researchers, notably Fransella, Bell and Bannister (2004:19) indicate an opposite viewpoint, by contending that "it is common practice for the elements to be chosen by the grid designer (researcher) as did Kelly (1955) when he designed his role-title list (element set)." Other researchers, Neimeyer and Stewart (1996) and Yorke (1978) recognise that elements can be specially designed by a research team, for example photographs of people (Bannister, 1962; Hare, 1997, Wooster, 1970), video-tape extracts (Hopwood and Keen, 1978), Rorschach cards (Salmon, Arnold and Collyer, 1972), brightly coloured stand-up models (Salmon, 1976) and drawings (Dalton, 1996; Ravenette, 2003) amongst others. There may, however, be a danger that this approach contains implicit assumptions regarding the participant's perceptions of the researcher's verbal labels. This brings to mind the following quote "...We know they know we know their code." from Peter Ustinov's (1961) film, "Romanoff and Juliet". Whilst grids may be designed from elements specified by the researcher and subsequently constructs elicited, the inverse of this procedure has also been known, where the elicitation of elements uses constructs as stimuli (Yorke, 1978).

From the above on-going debate, it was realised that the nature of the elements to be selected by the researcher would be likely to have an important bearing on the constructs elicited. The elements were, therefore, carefully chosen to be a valid and representative sample (Kelly, 1955/1991; Bannister and Fransella, 1966; Epting et al., 1971; Winter, 1983) for the current investigation into e-moderator perceptions of their online role(s) and relationships. Yorke (1978:64) suggests that "if one is to study the perceptions of 'teaching', the elements should be teaching situations rather than teachers themselves."

In contrast, Perrott et al. (1976) conclude that to select 'teachers' as mediators of teaching would tend to emphasise teaching style or teacher's characteristics at the expense of a more penetrating analysis of the way in which participants construe *teaching* itself (Hopwood and Keen, 1978). From this perspective, it was recognised that e-moderators also construc "the tools of the trade" (Berge, 2001; Paulsen 1994; Turoff, 1997) and use competences (Feenberg, 1989; Salmon, 2004) with the intention of creating optimal learning environments in virtual classrooms, implementing asynchronous discussion boards. These e-moderating situations may, therefore, include such skills as online socialising, weaving, summarising, archiving, scaffolding, and knowledge construction.

7.2.3 Personal versus Provided (supplied) Elements

Differences between the use of personal and supplied elements have been explored by researchers who have gained insight to the very nature of the process of elicitation itself. While it was recognised that a constructionist expects high levels of individuality in the construct systems which participants use to construe the self, they are in fact, creating the many texts/narratives that guide their actor selves as they author their self-stories (Mancuso, 1996) In this way, role repertory grid approaches are built from the assumption that "persons differ from each other in their construction of events" This is Kelly's (1955/1991) Individuality Corollary (Appendix A2).

It follows that investigators have developed techniques that allow for evaluations of the idiosyncratic perspectives that a participant has developed for his/her own convenience in construing events, where the term events may be interchanged, according to Kelly (1955) as subordinate constructs (i.e. elements).In general, however, it is most usual for the grid creator to select the elements to be construed (Adams-Webber, 2001; Weinreich and Saunderson, 2003; Stewart, 2005).

7.2.4 The wording of Elements

Having studied a number of research applications for repertory grid designs (Yorke, 1978; Salmon and Clare, 1984; Thomas and Harri-Augstein, 1985; Salmon, 2003), it was noted that reference was made to specific clarity in the wording of elements, to be understandable to participants in a research sample. For example several researchers, namely, Barton, Walton and Rowe (1976), Davis and Cunningham (1985) and McConachie (1985), showed how to develop elements for research participants with specific learning difficulties.

While at the same time the phrase *range of convenience* is used by Kelly (1955), to avoid obscurity of a clear boundary within which to develop the *operands* (elements) in order to elicit the *operators* (constructs). Fransella, Bell and Bannister (2004:8-9) were able to discuss this issue regarding Kelly's Range *Corollary* by contending that "All grids involve a consideration of the range of convenience (Corollary 6, Appendix A") which states that a construct (or a subsystem of constructs containing elements) always operates within a context, and there is a finite number of elements to which it can be applied by a given person at a given time....Obviously the range of convenience of our constructs can be and sometimes is extended in poetry, intoxication and inspiration."

A preliminary task identified how researchers throughout the decades from Kelley's first observations in the mid-50s up to date, a span of fifty years (1955-20005) had tackled issues

arising from the wording of elements. Those elements, which were unravelled from several research papers, may appear as people, objects, events and activities.

Elements most often used are people (Kelly, 1955; Ryle and Lunghi, 1970; Davis, 1976: Simons, 1976; Eden et al., 1984; Miall, 1988; Horgan et al., 1989; Gushin et al., 1998; Cruise et al., 2000). However other researchers use objects (Boxer, 1985; O'Cinneide, 1986; Jankowicz, 1987; Grajfoner et al., 2002), events (Petrenko et al., 1995; Hadley, 1999) and activities (Jones, 1997; Stojnov et al., 1997; Jones et al., 1998). In other words, grammatically speaking, elements are worded as nouns and verbs. But caution needs to be taken.

Stewart (2005) warns us to avoid abstract nouns such as leadership, 'my ideal subordinate' and 'the enemy', but rather employ nouns that relate to specific people (car driver, captain, cyclist) and specific objects (e.g. car, ship, bicycle). It should also be noted that verb elements i.e. events and activities should be pinned down as closely as possible in time and space (Jones, 1997; Petrenko, 1995; Stojnov et al., 1997). For example the kind of event that one could have taken in a short film clip (Hopwood and Keen, 1978; Grajfoner et al., 2002).

Another innovation is described by Hunt and Gow (1984) who applied the repertory grid technique to investigate teacher thinking. In their methodology, Hunt and Gow (1984) used 'metaphors' as elements (e.g. cooking, gardening and coaching) to describe their teaching activities, which were clearly understood by their participants in their own unique way. Indeed, by such metaphorical construing of elements, a narrative develops to tell and give insight to their story.

7.3 Pragmatic Perspective: Specific Characteristics for selecting Elements

The purpose of the research instrument that was about to be designed was to elicit e-moderator perceptions of their online role(s) and relationships. As a starting point it was essential to have some clear guidelines regarding specific characteristics of a sound subsystem of elements. The following list provides some basic assumptions about elements (Jankowicz, 2003; Stewart, 2005) that were to be addressed:

- elements must be discrete;
- elements must be homogeneous;
- elements should not be sub-sets of other elements;
- elements should not be evaluative.

7.3.1 Elements must be discrete

As has already been observed, elements most often are people, objects, events and activities. Stewart (2005) goes as far to say that people learning to use the Grid technique are uncomfortable with this rule of generating discrete elements, objecting that it may be possible to select over-trivial elements. The point here is, that if elements are so broad as to be

imprecise, then construing constructs from them often lies out of the *range of convenience* for the participant to respond, in practical terms. This is discussed later in the methodology regarding construct elicitation.

There is a danger that researchers should avoid. Stewart (2005:8) identifies the type of problems with the following example: "...if you chose varieties of car as elements...Do not use features of cars as elements (2-door, hatchback)...because you are jumping the gun by using as elements things that should really emerge in the construct-elicitation process.."

Thus the researcher may also be warned of the use of adjectival and adverbial phrases as elements. Again the warning is simple. It can be re-phrased, "do not use features of elements as elements; use the elements themselves". As already observed earlier, (Section-5), it is sound practice to use nouns and verbs.

7.3.2 Elements must be homogeneous

This particular characteristic of homogeneity almost speaks for itself (Fransella, Bell and Bannister, 2004). Difficulties in selecting elements for elicitation purposes can be imagined if elements were heterogeneous. For example, if people and things and events and activities were to be put together in a subset of elements (e.g.' manager' and 'desk' and 'conference' and 'reporting', respectively) the participant eliciting constructs (see next chapter in methods relating to construct elicitation) would more than likely, run into difficulty because it is essential to compare 'like with like' (i.e. noun with noun; verb with verb)

Stewart (2005:8) suggests (with tongue in cheek) that:"...a little private practice with one or two non-homogeneous sets will show you (researcher) how difficult the procedure becomes and how few constructs you (researcher) can get..."

7.3.3 Elements should not be sub-sets of other elements

An analogy in understanding the significance of obtaining elements that make sense for research purposes is given by Stewart (2005). She compares a researcher to a surveyor when mapping out a new piece of land. Surveyors, Stewart observes, start by selecting a few key points on that piece of ground. Stewart (2005:8) warns against the danger of using elements that are subsets of other elements by contending that "The surveyor will get into trouble if one of his landmarks (element) is a churchyard and another landmark (element) is a tombstone within the churchyard (element)."

Furthermore Kelly (1991:51) advises a would-be repertory grid designer to take care to ensure "...a system as a grouping of elements in which incompatibilities and inconsistencies have been minimized." This kind of system of elements should produce more reliable responses from subjects.

7.3.4 Elements should not be evaluative

Both Jankowicz, (2003) and Stewart (2005) give warnings that it is particularly easy for researchers to use elements, particularly events and activities that may contain an *'evaluative flavour'*. An example to illustrate this might be the phrases *'motivating my staff'* and *'leading the team'* which are seen to contain a high degree of implicit evaluation that would make them difficult to handle in the construct elicitation process.

7.4 Selection of empirical elements for the research investigation

Kelly (1955:161/230) defines elements in his range corollary, as follows. "...Elements should be within the range of convenience of the constructs used." An important key to choosing the elements for the research investigation was that they were also to be representative of the area being investigated. Kelly (1995:232) contends that "if the test is to indicate how the subject develops his role in the light of his understanding of other people, it is necessary that the other people appearing as elements in the test be sufficiently representative of all the people with whom the subject must relate his self-construed role."

For the purposes of the research, Kelly's guidelines were found to be not only useful but also practical, especially his advice in determining how the empirical elements were to be elicited. In other words "If the instrument is to indicate how the e-moderator develops his/her online role in the light of his/her understandings (i.e. perceptions) of their online activities, it becomes necessary that the activities appearing as elements in the test are sufficiently representative of all the activities with which the subject (e-moderator) must relate to his/her self-construed role."

It was observed, with a critical eye, that a common practice amongst grid designers (researchers) allows them to pre-select / supply the elements according to Fransella, Bell and Bannister (2004:21) 'in order to meet the requirements of a particular situation'. An awareness of this imposition of elements on prospective research subjects, i.e. e-moderator practitioners, heightened problematically through many discussions on this very principle regarding the implementation of elicited versus supplied elements. It was recognised that each method would differentially influence the type of constructs elicited. That is to say that the constructs elicited are method-dependent. With the above quote in mind (Fransella, Bell and Bannister, 2004:21) it was decided to supply the elements. This decision was also based on the researcher's experiential understanding of the representativeness of elements with respect to e-moderating online, drawn from experiences when participating in e-moderating training courses. Six e-moderating competences that appeared key to successful e-moderating were

considered, namely, (i) weaving (ii) archiving (iii) summarising (iv) scaffolding (v) knowledge constructing and (vi) socialising. These were subsequently selected as elements for an initial pilot study. In the following paragraphs, these six e-moderating competences are briefly outlined before arranging them in triads for the process of eliciting constructs.

7.4.1 Weaving

Feenberg (1989) coined the term 'weaving' to describe the flow of discussion and how it can be pulled together. It is a means whereby e-learners may recognise that their inputs become a meaningful contribution as their e-moderator collects their statements from their online postings, relating them to concepts and theories relevant in their course.

7.4 2 Archiving

The process of filing away sets of discussions for later use or reference that e-learners may wish to re-visit, facilitates storage and retrieval. Archives may also be useful to facilitate comparisons between discussion themes. Frequently, archiving is an effective means in handling postings when they become too numerous. In consideration of an ethical approach to archiving it should be clarified with e-learners where participants will find their contributions, by seeking the permission of the contributors.

7.4.3 Summarising

The main purpose of summarizing is to signal the closure of an e-tivity, reminding participants of the journey they have travelled. A summary may provide a footprint as a spark for a new e-tivity. At the same time, the summary may also reinforce and imprint new information and knowledge.

7.4.4 Scaffolding

Scaffolding means gradually building on participants' previous experience. A structured learning scaffold offers essential support and development to participants at each stage, as they build up their expertise in learning online.

7.4.5 Knowledge constructing

Thinking is clearly the key to making information useful (McDermott, 1999), in the process of constructing knowledge networks online.

The three main types of thinking activity recognised by Sternberg (1999) are namely:

i. ***Critical, analytical thinking,***
   Including judging, comparing and contrasting and evaluating;
ii. ***Creative thinking,***
   Including discovering, inventing, imagining and hypothesizing;
iii. ***Practical thinking***
   Including applying, using and practising

In selecting this activity, i.e. Knowledge Construction, as an element, I knew that in promoting knowledge construction, e-moderators seek to engender thinking processes to motivate e-learners to actively think and interact with others online. In this way, the potential of developing newly constructed horizons built on previous knowledge becomes an effectively powerful means of self-directed learning. "There is more than one way to teach well, the ability to be self-directed is situational, and just as dependency and helplessness can be learned, self-direction can be learned." (Lauzon, 2000:2). This e-moderator activity online determines the intensity of the degree of constructive interactivity between e-moderators with e-learners and e-learners with their online peers in collaborative knowledge construction through meaningful exchanges.

7.4.6 Socialising

Osland and Bird (2000), recognise that important lessons are to be learnt about cross-cultural interaction. In particular, tolerance and effectiveness emerge from a greater understanding of multiple perspectives and points of view. Goodfellow et al. (2001), furthermore, envisage that each individual or group has something unique and special to offer. Wenger (2000) tells us that there are three main components in creating an online community, namely, joint enterprise, mutuality and shared repertoire.

The next section explains why and illustrates how triads of the above six e-competences (elements) were selected from which constructs were to be elicited by participant e-moderator practitioners.

7.5 Designing Triads of Elements for elicitation of personal constructs

The elicitation of bi-polar personal constructs using triads of elements is the original method used by Kelly (1955). It involves the presentation of three elements, followed by the question *"How are two of these elements similar and thereby different from the third element?"* This question is followed by *"How is the third element different from the other two?"* Epting, Schuman and Nickeson (1971) argue that when two elements at a time (i.e. dyads) are used, more explicit contrast poles (also known as *Implicit* Poles) are obtained and the procedure is less time-consuming than using triads of elements. In this instance, the initial question would be *"How are these two elements alike?"* giving rise to the *Emergent* Pole or if this would not be the case for a particular participant, then a question referring to differences would also be appropriate, e.g. *"How are these two elements different?"* I.e. giving rise to the *Implicit* Pole.

Elicitation of personal constructs using single elements (i.e. monadic elicitation) consists of asking participants to describe in their own words what the presented element conveys to them. This monadic technique limits the interviewer's task to recording the constructs as they

appear and then asking for the opposite poles (Feixas and Alvarez, 2008). Yet another technique is described by Tan and Hunter (2002) as the *full context form*. This technique is explained by Siau et al. (2007:5) where "the research participant is required to sort the whole pool of elements into any number of discrete piles based on whatever similarity criteria chosen by the participant. After the sorting the research participant will be asked to provide a descriptive title for each pile of elements." For example the pool of elements may consist of four or more elements. If four elements were to be used it would create complicated decision making (i.e. whether 3 were alike & 1 different or whether 2 were alike & 2 different) and recording results could become burdensome and very time-consuming. It is not a professional approach for an interviewer to observe interviewee annoyance created by unnecessarily difficult interview tasks. Curtis, Wells, Lowry, and Higbee (2008:51) contend that participants may become "frustrated by indirect eliciting procedures and that direct questions may be more effective."

Caputi and Reddy (1999:257) conclude that implementing a triadic technique for the elicitation of personal constructs is more useful than a monadic or dyadic elicitation technique because the constructs elicited through triads "have greater variation and are better able to discriminate among many elements...and generally produce results that are more cognitively complex."

The design of triads from six selected e-moderator online competences was based on the application of a statistical calculation to find a combination of three items out of six. The following formulae were used, which are to be found in Freund (2004) "*Mathematical Statistics with Applications* ".

Whilst the formula for all the possible arrangements, or *permutations* of three items (r=3) out of five (n=5) may be given as

$$ {}^{n}P_{r} = \frac{n!}{(n-r)!} \quad \text{so that} \quad {}^{5}P_{3} = 60 $$

The formula for possible *combinations*, regardless of their permutations, (where n= 5 and r=3) may be given as

$$ {}^{n}C_{r} = {}^{n}P_{r} / r! $$

which gives $$ {}^{n}C_{r} = \frac{n!}{r!\,(n-r)!} \quad \text{so that} \quad {}^{5}C_{3} = 10 $$

From the above calculations, the result of ten combinations were obtained, if 3 items (a triad) were to be chosen from a set of five elements.

However, if the number of items in the set of elements were to be increased to six, the outcome can be obtained as follows:

$$ {}^{n}C_{r} = \frac{n!}{r!(n-r)!} \quad \text{so that} \quad {}^{6}C_{3} = 20 $$

From several sources (Fransella and Crisp, 1979; Caputi and Reddy, 1999; Hagans, Neimeyer and Goodholm, 2000), it was possible to ascertain that there is no set number of elements that best aid the researcher in the quest of construing private worlds. However, this aside, considering the construing phase pragmatically along a time line, the greater the number of elements the greater the number of triadic combinations and therefore, if these were to be all taken into account by a participant, to arrive at personal bipolar constructs for each triadic combination, a great deal of time would be taken up. It is interesting to note that Hinkle, (1970) suggests that a random set of triads may be used to elicit participant constructs as a more practical research approach. A decision was taken to draw up a table for the twenty triadic combinations obtainable from a set of six elements, as labels describing e-moderating online activities, namely:

1. Weaving
2. Archiving
3. Summarising
4. Scaffolding
5. Knowledge Constructing
6. Socializing

Table 7.1 illustrates the triadic combinations of the above numbered research elements.

Table 7.1: The triadic combinations of the above numbered research elements (1-6)

123	234	245	314	345	415	516
124	235	246	315	346	416	536
125	236	256	316			546
126						

The following Table 7.2 below illustrates how triadic combinations from the numerically tagged e-competences (i.e. elements) in Table 7.1 were allocated the respectively appropriate descriptor tags for the e-competencies (i.e. elements)

Table 7.2: Descriptive labels in the triadic combinations of the above numbered research elements (1-6) from Table 7.1

Weaving Archiving Summarising	Archiving Summarising Scaffolding	Archiving Scaffolding Knowledge constructing	Summarising Weaving Scaffolding	Summarising Scaffolding Knowledge constructing	Scaffolding Weaving Knowledge constructing	Knowledge constructing Weaving Socializing
Weaving Archiving Scaffolding	Archiving Summarising Knowledge constructing	Archiving Scaffolding Socializing	Summarising Weaving Knowledge constructing	Summarising Scaffolding Socializing	Scaffolding Weaving Socializing	Knowledge constructing Summarising Socializing
Weaving Archiving Knowledge constructing	Archiving Summarising Socializing	Archiving Knowledge constructing Socializing	Summarising Weaving Socializing			Knowledge constructing Scaffolding Socializing
Weaving Archiving Socializing						

Note: Colour Codes, Yellow, Green and Pink refer to triad selections for Participants (A), (B) and (C) i.e. George, Mary and Linda respectively (Outcomes to be found in Section 7.7)

7.6 Method of Eliciting bipolar constructs

Kelly (1969:293) concludes that "a construct is like a reference axis. A basic dimension of appraisal often unverbalised, frequently unsymbolised, and occasionally insignified in any manner except by the elemental process it governs. Behaviourally it can be regarded as an open channel of movement, and the system of constructs provides each man with his own personal network of action pathways, serving both to limit his movements and to open up to him passages of freedom which otherwise would be psychologically non-existent." The methodology implemented in the research gave useful insights to e-moderator perceptions of their online roles in virtual classrooms. Kelly (1955) based his triadic elicitation method on his theory of how constructs are first formed. He sees constructs as bipolar dimensions, having an emergent pole and implicit pole (opposite in nature to the emergent pole) By using the method of triadic differences, the researcher presents three elements at a time asking *"How are two alike in some way,*(emergent construct 1) *but different from the third* (implicit construct 1).However, in another method, known as the triadic opposite, whilst also using three elements at a time, the researcher asks *"How are any two of these alike in anyway?"*, followed by," *What is the opposite of that?* In all his definitions, Kelly (1955, 1969) retains the essential notion that constructs are bipolar as stated in his *Dichotomy Corollary.* His argument is that we never affirm anything without simultaneously denying something. This is an important point for it makes the notion of a construct different from the notion of a concept. Fransella, Bell and Bannister (2004:7) indicate this clearly as follows: "...When we say that Mary Bloggs is 'honest', we are not saying that Mary Bloggs is 'honest' and she is not a chrysanthemum or a battleship or the square root of minus one. We are saying that Mary Bloggs is 'honest' and she is not a crook, nor is she evasive – or whatever is the opposite of the construct for Mary."

Kelly's notion of a construct embraces the view that a construct is a way of transcending the obvious, where he also emphasizes that when we make a new abstraction out of events, we are escaping from the limitations of the facts of earlier abstractions. It is a good idea always to bear in mind that the constructs elicited for a grid only provides a very small glimpse of how a person construes the world. Husain (1983) clarifies this point, by stating that all constructs have only one opposite. Any single personal constructs is part of a whole construing system – a network of constructs – and as we may find, further, may differ in how they are elicited in different contexts i.e. the same triad of elements may give rise to one or more bipolar constructs. Hinkle (1965:22) even warns us that contextual confusions can give rise to "implicative dilemma and conflict...they can produce low construct interrelationships or ambiguous implication interaction..."

7.7 Outcomes from Initial Pilot Study Sample (n=3)

In the present study the use of supplied elements provided a focus for the inquiry as did the guidelines (Figure 7.1, The Participant Information Sheet) shown below. These guidelines gave each interviewee insight to the elicitation process of bipolar constructs on the basis of considering the way in which the elements were related to e-moderator pedagogical leadership competencies (i.e. degrees of task-giving and motivational support) and e-moderator perceptions of their e-learner capabilities (i.e. degrees of collaborative capability and knowledge construction ability).

Figure 7.1 The Participant Information Sheet given prior to commencement of Interview

PARTICIPANT INFORMATION SHEET

The research investigation is seeking to find your views and perceptions about online teaching and learning using a methodology adapted from personal construct psychology. It focuses on your leadership skills

- In your task-giving and motivational support role and
- how you view your e-learners' capabilities for collaboration and your e-learners' knowledge construction abilities.

There are two stages in the process to link your online teaching skills with your online leadership skills.

1. You will be shown a list of 6 online teaching skills (called elements for the purpose of the research) which have been grouped into threes (triads) as shown in the chart below. You will be asked to select any triad of your choice.

Table of 20 Triads

TRIAD 1 Weaving Archiving Summarising	**TRIAD 2** Archiving Summarising Scaffolding	**TRIAD 3** Archiving Scaffolding Knowledge constructing	**TRIAD 4** Summarising Weaving Scaffolding	**TRIAD 5** Summarising Scaffolding nowledge constructing	**TRIAD 6** Scaffolding Weaving Knowledge constructing	**TRIAD 7** Knowledge constructing Weaving Socializing
TRIAD 8 Weaving Archiving Scaffolding	**TRIAD 9** Archiving Summarising Knowledge constructing	**TRIAD 10** Archiving Scaffolding Socializing	**TRIAD 11** Summarising Weaving Knowledge constructing	**TRIAD 12** Summarising Scaffolding Socializing	**TRIAD 1 3** Scaffolding Weaving Socializing	**TRIAD 1 4** Knowledge constructing Summarising Socializing
TRIAD 1 5 Weaving Archiving Knowledge constructing	**TRIAD 1 6** Archiving Summarising Socializing	**TRIAD 1 7** Archiving Knowledge constructing Socializing	**TRIAD 1 8** Summarising Weaving Socializing			**TRIAD 1 9** Knowledge constructing Scaffolding Socializing
TRIAD 20 Weaving Archiving Socializing						

2. Bearing in mind the following criteria:-
   - your degrees of task-giving online (in terms of a little/a lot) and your degrees of motivational support online (in terms of a little/a lot) AND / OR
   - how you view your e-learners' capabilities for collaboration (in terms of a little/a lot) and your e-learner's knowledge construction abilities (in terms of a little/a lot).

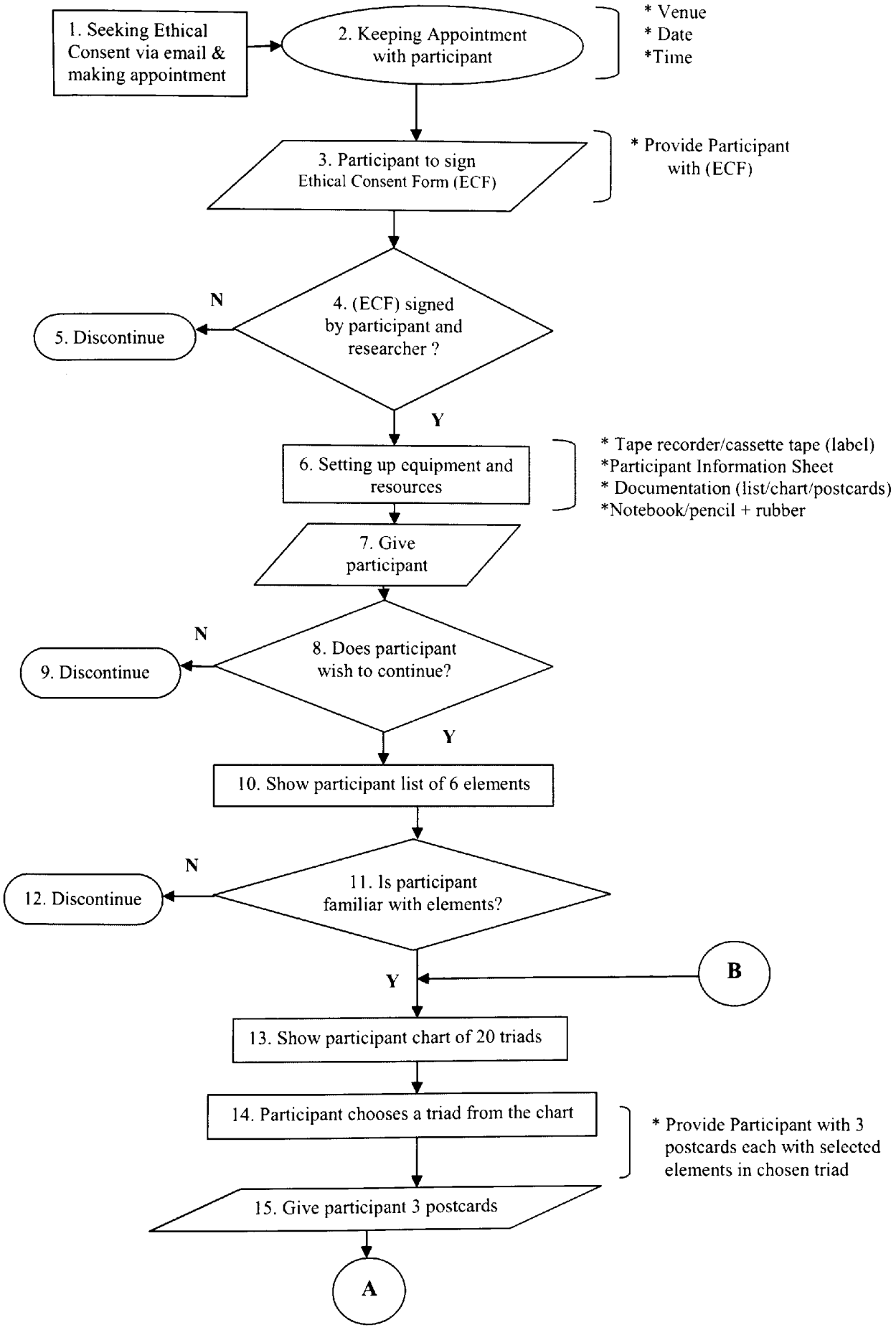
   You will be asked to discuss how 2 elements in the triad are ***similar*** to each other in one way or another and how the 3rd element is ***different*** from the other two.
3. The process is repeated with either the same triad or another one selected from the chart.

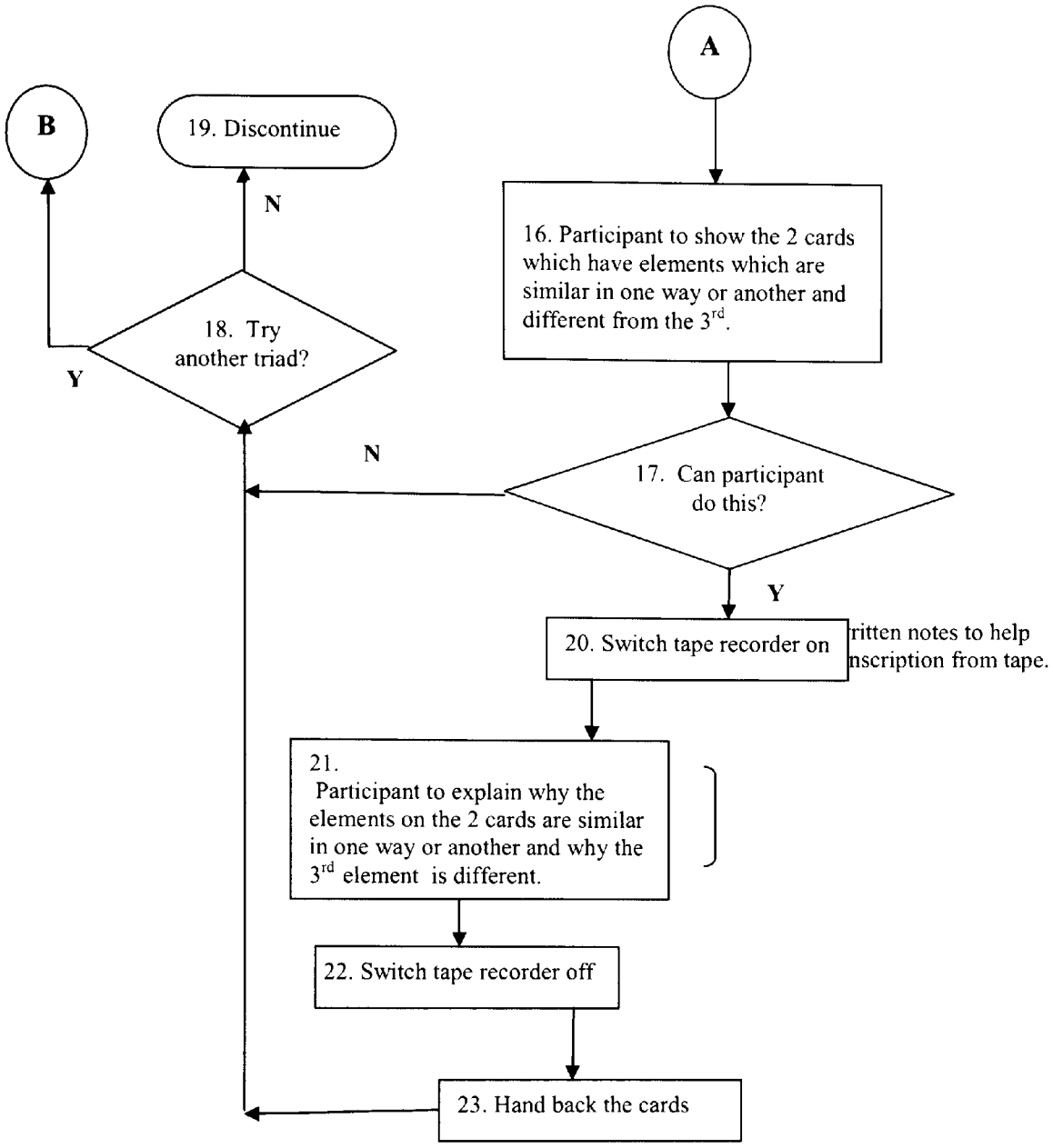
Thank you for your co-operation

NOTE: 1st Pilot Sample WORDING used OR 2nd Pilot Sample WORDING used AND / OR This is discussed in greater detail later.

KEY: The annotated flowchart in Figure 7.2 is a graphical representation of the process for the elicitation of bipolar constructs from a selected triad of elements. Each of the steps (7 – 21) is explained more fully later.

Figure 7.2 Flowchart of the Interview Procedure adapting PCP Method with Triadic Elements





Key: A and B are connector boxes.

In the Initial Pilot Study none of the three participants who volunteered to take part in construct elicitation from a selection of triads (see Table 6.2) discontinued or withdrew. In eliciting their personal constructs, each individual participant was assured that all ethical considerations would be adhered to regarding confidentiality and anonymity. At the same time the three participants were assured of the freedom to withdraw if they so wished at any time during the interview. An *Ethical Consent Form* (ECF) was issued at the beginning of the session, which both participant and researcher signed before the commencement of the data collection process.

An explanation of each of the steps (7 – 21) now follows as a blueprint for replication of the procedure with further sample populations. It was considered important to provide the

interviewee with a *Participant Information Sheet* in preparation of the elicitation process (step 7). The interviewing technique is designed to capture the ways in which people give meaning to their experiences in their own terms. Brown (1992:287) argues that that "for some participants the construct process can be monotonous and lead to higher participant dropout rates."On the other hand, Oppenheim et al.(2003) contend that construct elicitation is fun and challenging. Other researchers (Moynihan, 1996; Curtis, Wells, Lowry and Higbee, 2008) conclude that participants find the process intriguing. From these researcher insights, the *Participant Information Sheet*, shown in Figure 7.1, was designed to ensure that participants were clear about the interviewing procedure and that they were confident that they could fulfil the requirements necessary for useful data collection. If the interviewee agrees to continue with the process, a list of the six supplied elements is shown (step 10). If the participant wishes to withdraw at this stage then the process with the interviewee is discontinued (step12).

It will be noted that the elicitations process is geared as a confirmatory investigation relating to:-

- Participant's degrees of task-giving (in terms of a little/a lot) and their degrees of motivational support (in terms of a little/a lot) AND / OR
- how participants view their e-learners' capabilities for collaboration (in terms of a little/a lot) and their e-learners' knowledge construction abilities (in terms of a little/a lot).

If a participant feels that they are unsure of how to interpret the elements, after inspecting the six elements (step 10), there is the opportunity to withdraw (step 12), otherwise the table of 20 triads (found in the *Participant Information Sheet*) is used (step 13) and the participant will be asked to select a triad of their own choice (step 14). At this point the interviewer makes a note of the triad selected and gives the interviewee three separate postcards, each with one of the three selected elements in the triad chosen (step 15). The participant is then asked by the interviewer to show the 2 postcards which have elements which are similar in one way or another and different from the third (step16). If the interviewee is able to distinguish the postcards in this way (step 17) the tape recorder is switched on (step 20); if the interviewee fails to make such a distinction then the interviewee is given a choice as to whether select another triad (step 18) and the process starts again (steps 13). There is again an opportunity for the interviewee to withdraw (step 19). The next step is the crucial point where explanations are elicited for the 2 *similar* elements in one way or another and the reason for the third element being *different* relating to (i) task-giving and motivational support or (ii) to e-learners' perceived capabilities for collaboration and perceived abilities for knowledge construction.

In this way the elicitation process identifies how the participant online skills (elements) are applied relating to (i) their leadership qualities in task-giving and motivational support

and/or relating to (ii) their perceptions of their e-learners' collaborative capabilities online and their online knowledge construction abilities. The interviewer makes handwritten notes to assist in the tape transcription.

When step 21 is complete, the tape recorder is switched off and the three postcards are returned to the interviewer. The interviewee is then given a choice as to whether to select another triad (step 18) and the process starts again (steps 13) or to withdraw (step 19).

The next three sections discuss the outcomes from the three volunteer participants A, B, and C, with fictitious names George, Mary and Linda respectively.

7.7.1 Participant (A): Outcomes

Participant (A), who was given the fictitious name *George,* has a track record of excellence in his career as an outstanding tutor in HE, lecturing face to face. He had successfully completed an e-moderating course, but was not yet employed as an e-moderator. During the period of just under an hour, George had selected the following five triads.

Table 7.3 George's selection of triadic combinations of the numbered research elements (1-6)

Weaving **Archiving** **Summarising**	**Summarising** **Scaffolding** **Socializing**	**Archiving** **Knowledge constructing** **Socializing**	**Weaving** **Archiving** **Scaffolding**	**Summarising** **Weaving** **Scaffolding**

Note: The Yellow Colour Code key in Section 7.5, Table 7.2 matches the above selection of triads for George's construct elicitation (Date: 10.03.05)

The selection of the above five triads was carried out at random by *George*. By using the method of triadic differences, the three separate postcards, each with the name of a selected element in the triad, were presented to George. The interviewer then asked him *"How are two alike in some way,*(emergent construct 1) *but different from the third* (implicit construct 1). The elicited bi-polar constructs from each of the triadic elements were recorded as shown.

Table 7.4: George's record of bipolar construct elicitation

Record Number	Selected Triad of Elements	2 Elements that are the Same	Elicited bipolar CONSTRUCTS Emergent Pole	 Implicit Pole	Element as the odd-one-out
1	**Weaving** **Archiving** **Summarising**	**Weaving** **Summarising**	Online e-learner Motivation	v. 	storage base for later recall	**Archiving**
2	**Summarising** **Scaffolding** **Socializing**	**Scaffolding** **Socializing**	Interactive e-learner Exchange of ideas	v. 	no further Exchange of ideas	**Summarising**
3	**Archiving** **Knowledge constructing** **Socializing**	**Knowledge constructing** **Socializing**	Creative interaction Developing knowledge bank	v. 	non—creative knowledge depository	**Archiving**
4	**Weaving** **Archiving** **Scaffolding**	**Weaving** **Scaffolding**	Student-centred Ongoing Corroboration	v. 	Info-retrieval Passive/complete	**Archiving**
5	**Summarising** **Weaving** **Scaffolding**	**Weaving** **Scaffolding**	Ongoing e-learner e-tivity enhancement	v. 	complete/end of e-tivity phase	**Summarising**

With each elicitation of bi-polar constructs, *George's* statement describing the reason for each bi-polar construct was recorded and used in the corroboration of the model for *Pedagogical Variation* (Chapter Eight and Chapter Eleven).

7.7.2 Participant (B): Outcomes

Participant (B), who was given the fictitious name, *Mary,* has participated in the University e-moderating INSET course as part of her continuing professional development. She has an outstanding knowledge of e-moderating. She has not worked as an e-moderator, but hopes to soon. During the period of 40 minutes, Mary had selected the following five triads, to construe her experiences of her online e-moderating activities.

Table 7.5: Mary's selection of triadic combinations of the numbered research elements (1-6)

Archiving Scaffolding Knowledge constructing	Summarising Weaving Socializing	Weaving Archiving Socializing	Knowledge constructing Summarising Socializing	Scaffolding Weaving Knowledge constructing

Note: The Green Colour Code key in Section 7.5, Table 7.2 matches the above selection of triads for Mary's construct elicitation (Date: 16.03.05)

The outcomes obtained from *Mary* fell into a significant pattern, where she echoed to a certain extent the results obtained from *George.* For both *summarising* seems to be the odd-one-out on two occasions, signalling the end-of-an-activity. As this construct may imply the opposite pole to 'beginning-of-activity', it was observed that the polar differences were shown to be motivation, exchange of ideas, e-tivity enhancement. When these bi-polar constructs were analysed as meaningful labels, there appeared to emerge a whole new spectrum of perceived notions, as the elements faded into the background. Extracting the bi-polar constructs in this way seems already to lead into new landscapes.

Table 7.6: Mary's record of bipolar construct elicitation

Record Number	Selected Triad of Elements	2 Elements that are the Same	Elicited bipolar CONSTRUCTS			Element as the odd-one-out
			Emergent Pole		Implicit Pole	
6	Archiving Scaffolding Knowledge constructing	Scaffolding Knowledge constructing	e-learner centred	v.	stored knowledge base	Archiving
7	Summarising Weaving Socializing	Weaving Socializing	Online Motivation	v.	completion signal	Summarising
8	Weaving Archiving Socializing	Weaving Archiving	Task-oriented	v.	People-oriented	Socializing
9	Knowledge constructing Summarising Socializing	Knowledge constructing Socializing	knowledge through shared experiences (ongoing)	v.	final "say"	Summarising
10	Scaffolding Weaving Knowledge constructing	Scaffolding Knowledge Constructing	Supporting Emergence of ideas (active)	v.	collecting ideas (passive)	Weaving

With each elicitation of bi-polar constructs, *Mary's* statement describing the reason for each bi-polar construct was recorded and used in the corroboration of the model for *Pedagogical Variation* (Chapter Eight and Chapter Eleven).

7.7.3 Participant (C): Outcomes

Participant (C), who was given the fictitious name, *Linda,* had participated in the University e-moderating MAPD (Master's in Professional Development) course as part of her continuing professional development. She is looking for her first job in e-moderation. *Linda* is a lecturer in a traditional face-to-face lecture theatre at a local college of Further Education. During the period of 20 minutes, *Linda* had selected the following five triads, to construe her private world of hands-on, online e-moderating experiences.

Table 7.7 Linda's selection of triadic combinations of the numbered Research Elements (1-6)

Archiving Summarising Knowledge constructing	Knowledge constructing Weaving Socializing	Summarising Weaving Knowledge constructing	Weaving Archiving Knowledge constructing	Knowledge constructing Scaffolding Socializing

The Red Colour Code key in Section 7.5, Table 7.2 matches the above selection of triads for Linda's construct elicitation (Date: 09.04.05)

Linda's insights to her online experiences on the e-moderating course provided another set of bi-polar constructs that are tabulated below in Table 6.9 Again when the actual elements fade into the background, bipolar constructs are emerging that provide a rich tapestry for further analyses.

Table 7.8: Linda's record of bipolar construct elicitation

Record Number	Selected Triad of Elements	2 Elements that are the Same	Elicited bipolar CONSTRUCTS Emergent Pole		Implicit Pole	Element as the odd-one-out
11	Archiving Summarising Knowledge constructing	Archiving Knowledge constructing	Subject-based learning	v.	student-based learning	Summarising
12	Knowledge constructing Weaving Socializing	Knowledge constructing Socializing	Learning through Social insights	v.	learning through hindsight recollection	Weaving
13	Summarising Weaving Knowledge constructing	Weaving Knowledge constructing	Creating new meanings	v.	collecting previous contributions	Summarising
14	Weaving Archiving Knowledge constructing	Archiving Knowledge constructing	Knowledge compacting	v.	knowledge expanding	Weaving
15	Knowledge constructing Scaffolding Socializing	Knowledge constructing Socializing	Freedom to explore ideas confidently	v.	restricted frame to support non-confident e-learners	Scaffolding

With each elicitation of bi-polar constructs, *Linda's* statement describing the reason for each of the bi-polar constructs was recorded and used in the corroboration of the model for *Pedagogical Variation* (Chapter Eight and Chapter Eleven).

In the next section, the findings, of the initial pilot sample with respect to how e-moderators reveal their experiences of their online roles is discussed further. These findings raise more questions than answers.

7.8 What the Initial Pilot Study reveals

The Initial Pilot Study supported the notion that it is possible to bring together a set of elements from a range of e-moderating competences (see Section 6.4, Selecting Elements) that were easily identifiable and relevant to each of the participants in the Initial Pilot Sample (n=3). The process of a random selection of triads from a set of six elements, in total twenty triads, did not appear to be overwhelmingly time-consuming.

A growing literature has developed over the question of whether or not supplied or provided constructs give the same answers as elicited constructs (Procter, 2003; Adams-Webber, 1998; Neimeyer and Leso, 1992). All constructs are personal in the sense that a person is able to place them over events and make sense of them. Another person's constructs may not be precisely as useful to us as our own. If there is some doubt about the meaningfulness of a construct for an individual it is possible then to refer back to the individual. Indeed the triadic elicitation process became an intriguing one, as participants were given the freedom to choose the 'similarity' and 'differences' in the elements of each selected triad.

The elicitation of e-moderator constructs in this Initial Pilot Study revealed that e-moderators identified the reasons for their effectiveness online to be (i) the quality and quick turnaround of their feedback, (ii) availability (as a tutor) at key times and (iii) approachability. The e-moderating practitioners characterised themselves as a counsellor, tutor and subject specialist. This study can be utilised by e-learning practitioners to develop an effective code of practice for e-moderators. The statements, providing reasons for e-moderator choices of elements during the elicitation of bipolar constructs, were carefully recorded (APPENDIX D1) and used to corroborate the *Pedagogical Variation* Model for online teaching and learning (Chapter Eight and Chapter Twelve)

The researcher had no difficulty in designing a method of tabulation using Microsoft Excel to record participants' responses; neither was the use of Microsoft Excel tools a problem to produce the final data analysis results. No other software was required to aid in either the data collection process or the analysis of data. Graphical illustrations, e.g. bar charts and pie charts were created from the data also using the same software effectively.

7.9 Collection of e-moderator statement for corroboration of hypothetical models

The data gave invaluable insights that were interpreted using coding template (Appendices B4 and B5) for content analysis of the e-moderator statements. This procedure is discussed in in the next chapter, Chapter Eight. The e-moderators practitioners in the research sample had explained their choices for choosing two elements which appeared to them to be the same and the third to be different from a triad of supplied elements. Some may critique this method using supplied elements as problematic, but having selected the six elements carefully i.e. six online competences, listed here in no particular order - (i) weaving (ii) archiving (iii) summarising (iv) scaffolding (v) knowledge construction and (vi) socialising, none of the e-moderators in the sample population had difficulty in understanding the usage of terms. That is to say that each of the supplied elements had fallen into what Kelly (1955) calls "the range of convenience". An explanation can be given for this. All the e-moderators had undergone the same initial e-moderating training module offered by ECW UoG, based, at the time, on Salmon's (2000) Five-Stage e-moderating Model. The training course provided numerous online tasks that were based strongly on the above six e-moderating behaviours. An example of the way in which the bi-polar constructs were examined and analysed, is given in Table 7.9 below. It shows how the research participant selected the two elements as similar (i.e. emergent pole) and the third element, from the triad, as different (i.e. implicit pole) to the other two. Data fragments (red and blue) were analysed using numerical superscripts to indicate how they provided supporting evidence of the respective quadrants .in Models 1 and 2. A detailed discussion follows in Chapter Eight.

Table 7.9 Participant *George* :Record of Outcomes showing explanatory statements for *Emergent* Pole

Rec, No.	ID	Triad	Emergent Pole	Implicit Pole	*Statement Emergent Pole*
1	George	T1	1 3	2	I give the students many suitable tasks[2], and keep them highly motivated[4]
2	George	T12	4 6	3	Socialising encourages eLearners **to interact well**[5] and **exchange their ideas freely**[7] with one another.
3	George	T17	5 6	2	**Creative peer-group interaction**[5] fosters a **developing knowledge bank rich in ideas**[7].
4	George	T8	1 4	2	Only a little weaving and scaffolding is necessary to motivate[3] a student-centred, collaborative cohort. These eLearners generate their own problem-solving tasks with great enthusiasm, so there is little need for extra task-giving[1].
5	George	T4	1 4	3	Weaving and scaffolding motivates eLearners a lot[4] to keep up with a small amount of tasks[1].

Key Red fragments (e-moderator leadership) **Blue** fragments (perceived e-learner behaviour)

Table 7.10 Participant *George*: Record of Outcomes showing explanatory statements for *Implicit* Pole

Rec, No.	ID	Triad	Emergent Pole	Implicit Pole	*Statement Implicit Pole*
1	George	T1	1 3	2	Archiving is useful for lurkers **who don't come online**[6], **demonstrating lack of knowledge construction**[8].
2	George	T12	4 6	3	No further exchange of ideas .Summarising can motivate students by showing how to **tackle problem-solving tasks with which they struggle**[8]. Peer group likes to socialise to **collaborate**[5] but **weak in getting ideas together**[8]
3	George	T17	5 6	2	Maybe lack of confidence **prevents 'lurkers' from coming online**[6,8].The archives are task-based resources.
4	George	T8	1 4	2	**Many valued responses**[7] from a **busy interactive forum**[5] is very useful for information retrieval.
5	George	T4	1 4	3	At the end of an e-tivity phase, summarising completes the collection of e-learner responses. This takes less time for a cohort which **seldom posts**[8] **ideas due** to **difficulties in peer-group participation**[6]

The results from a 2nd Pilot Sample (n=7) and the Final Representative Research Sample (n=17) were tabulated on several charts (Appendices D2 and D3) to indicate the outcome of elicited constructs which e-moderator practitioners had construed during the investigation discussed in Chapter Eleven. Table 7.9 shows another three records.

Table 7.11 Examples of three records obtained during the elicitation process

Record Number	**Selected Triad of Elements**	**2 Elements that are the Same**	**Elicited bipolar CONSTRUCTS**		**Element as the odd-one-out**
			Emergent Pole	**Implicit Pole**	
22	Weaving Archiving Scaffolding	**Weaving** **Scaffolding**	'pulling ideas together via active threads'	v. 'put away postings too bulky to handle - bring to a close	**Archiving**
26	Summarising Weaving Knowledge constructing	**Summarising** **Weaving**	Ideas/concepts developed explicitly via postings by e-moderator	v. e-learner tacit experiential conceptualisation	**Knowledge constructing**
35	Scaffolding Weaving Socializing	**Scaffolding** **Socializing**	adopting new teaching approaches without visual cues	v. enlivening postings by recombining subject-based ideas	**Weaving**

These three records, namely 22, 26 and 35 show the raw data before fragments of statement were matched as units of analysis using the four designed coding sheets to identify the variables for transactional and transformational leadership competencies (Apendix B4) and e-moderator perceptions of e-learner collaborative and knowledge construction abilities (Appendix B5)

Table 7.12 E-moderator statements elicited as reasons for their selection of bipolar constructs

ID	e-moderator	Statement for Emergent Pole	Statement for Implicit Pole
22	eM09	(a)*"when I pull together student's ideas by weaving ,it motivates online group to solve problems more easily because everyone's contribution is valued whether it's good or not so good. Gives me a chance to sort out misunderstandings. than to give more tasks"*	(b)*"sometimes things go out-of-hand with too many bulky postings from self confident, individual, independent students. I check frequently to see whether the several online tasks are complete to put away postings(close thread) in archive."*
26	eM25	(a)*"I can't seem to get to some of my cohort. I know they are there because I can tell from the software (monitoring system,) but they don't join in the thread...that's why I still try to motivate them with a lot of clear definitions/concepts / ideas.*	(b)*"Others in the cohort are quite different. Self-confident, self-reliant, independent, extremely good at problem-solving, showing tacit knowledge by learning from previous experiences Expect lots of challenges from me but not keen to share ideas."*
35	eM27	(a)*"we need to adopt new teaching approaches because we have no visual cues to engage 'lurkers' to join in. But this could be an advantage to them (lurkers); being invisible.. Frequent emailing is a good way of encouraging 'lurkers' to come online and detailed archiving keeps 'lurkers' informed."*	(b)*"It is useful to enliven postings by recombining subject-based ideas in fewer tasks to boost [4]online learner confidence, especially where they (online learners) struggle to cope[5] with demands of problem-solving topics. Often there is more socialising[6] going on."*

For each of the three records 22, 26 and 35 it can be noted that each of the three e-moderators, coded as eM09, eM25 and eM27, had freely disclosed how they managed to sustain, or not, their e-learners in the virtual learning space. The information gathered illustrated what life is like in virtual classroom. For example, eM09 has a busy time checking all the postings from independent self-confident e-learners, while eM25 has trouble with encouraging students who are lurkers to come online to participate in the discussion forum.

7.9.1 Sample Populations used in Empirical Study 1

Three sample populations were used in the first empirical study, Empirical Study 1. The following explanation provides reasons for this.

- 1st Pilot Sample (n=3) provided evidence that the three research participants were able to follow the instructions on the Participant Information Sheet (Figure 7.1) for (i) the selection of triads of elements (ii) decision-making during the elicitation of bipolar constructs (iii) providing statements explaining the similarities perceived for the emergent pole and the difference perceived in the odd-one-out, i.e. contributing to the implicit pole. (NB using the **OR** wording) for linking their e-moderating skills with their perceived leadership qualities

OR their perceptions of their e-learner online capabilities.. As a result of data analysis using the coding templates (Appendices B4 and B5) the 1st Pilot Sample gave evidence supporting Model 1 Quadrants (A, B, C and D) and Model 2 Quadrants (E, F G and H.) (Appendix D1 statements).

- 2nd Pilot Sample (n=7) provided evidence that the seven research participants were again able to carry out all the instructions on the Participant Information Sheet with the additional wording **AND/OR** for linking their e-moderating skills with their perceived leadership qualities AND their perceptions of their e-learner online capabilities. In this way the 2nd Pilot Sample gave evidence not only for the Quadrants in Models 1 and 2 but also for Model 3, the *Pedagogical Variation* Model., i.e. AE,BF,CG and DH (Appendix D2 statements)
- The Final Representative Research Sample (n=17) in the same way as the 2nd Pilot Study gave evidence of all three Models (Appendix D3 statements).

7.10 Summary

In this chapter the methodology for gathering empirical data using ideas borrowed from Kelly's (1955) Personal Construct Psychology (PCP) was discussed. The procedure for selecting elements was explained according to certain rules which conform to Kelley's eleven corollaries (Appendix A2). Whilst it may be open to criticism, the elements were supplied as six e-moderating competences which were understood by the research participants.

In the small initial pilot sample (n=3), there were no problems in the understanding of the elicitation process of selecting two elements that were the same and the third one different in a self-selected triad. An annotated flowchart (Figure 7.2) illustrated the interviewing procedure which allowed participants to withdraw at any stage. The results could be recorded to show how the outcomes of the selection procedure were obtained by the elicitation of statements from research participants who were able to explain their choice of bipolar constructs.

An example was given to illustrate how the resulting outcomes were to be used to corroborate the hypothetical models for online teaching and learning. In Chapter Eleven, a discussion of the outcomes of two further sample populations, namely, a 2nd Pilot Sample (n=7) and the Final Representative Research Sample (n=17) gives insights to the nature of the data obtained in this Empirical Study 1 (Appendices D1, D2 and D3).

In the next chapter, Chapter Eight, a discussion follows with an annotated flowchart (Figure 8.4), to show how the data from Empirical Study 1 was used to corroborate the three hypothetical models, Model 1, Model 2 and Model 3.

Chapter Eight

Corroborating the Hypothetical Models

8.0 Corroborating the Hypothetical Models: Preliminary insights

Oliver and Harvey (2002) conclude that although the theoretical position of the researcher is fundamental to his/her interpretation of data, this relationship remains largely unexplored within the context of e-learning/ e-moderation research and evaluation. Reflecting on this issue, I took my theoretical position into account, early on in the research because I knew it would shape the way in which the data was to be interpreted. Mitchell (2000) states that where this relationship is explored, it is often to lament the lack of scientific rigour. Importantly, criticisms such as this focus upon method (techniques) but remain silent on methodology (the 'science' of method, implying a commitment to a theoretical or philosophical position). Throughout the research I have made a deliberate attempt to underpin the research methodology with theoretical assumptions, before explaining the research instruments in the methods employed.

Having conceptualized the three hypothetical models (Chapter Six) using evidence from a leadership paradigm and the research literature (Chapter Four) and having completed the data capture using ideas borrowed from personal construct psychology (Chapter 6), this chapter seeks to address the ways in which the hypothetical Models can be supported by the empirical data collected from a sample population of e-moderators (Representative Research Sample (n=17)).

The foundations for developing a means to identify the degree of corroboration (Popper, 2002) with primary data from the empirical outcomes found in e-moderator statements is recorded (Chapter 6). The next section describes and explains how the content analysis was undertaken (Berg, 2004) of the numerous e-moderator statements (n=392) obtained during the elicitation process using twenty triads of six supplied elements.

8.1 Designing Coding Templates to identify the Testability of the three Hypothetical Matrix Models, 1, 2, and 3

Popper (2002) concludes that the deductive testing of theories is far more logical than inductive methods. Popper (2002:9) concludes that "from a new idea, put up tentatively and not yet justified in any way – anticipation, a hypothesis, a theoretical system, or what you will-conclusions are drawn by means of logical deduction. These conclusions are then compared with one another and other relative statements so as to find what logical

relationships such as equivalence, derivability, compatibility or incompatibility exist between them." It was realised that what Popper explains, here, underpins a major issue which I deliberated on with respect to deciding on how to carry out a fair test.

Ackroyd and Hughes (1992:23) offer their explanation for a hypothetico-deductive model for hypothesis testing. They observe that a hypothetico-deductive model "uses the general statements of the theory as premises in a deductive argument along with statements describing the conditions under which the test is carried out; a testable conclusion or prediction can be deduced and compared with empirical evidence. If the conclusion and evidence do not match then the theory is falsified; if they do match then there is some evidential support for the theory and its explanations."

Ackroyd and Hughes (1992) explanation summarises clearly how to set about testing a hypothetical conceptual model. This method of testing is appealing since it could be related to the procedure of using the characteristic components and constructs underpinning each of my three models to compare empirical evidence in the form of e-moderator statements.

8.1.1 The Coding Process: Determining the criteria for the coding templates

At this stage of the research, critical decisions had to be made about the criteria to use for comparing the factors underpinning each of the models as well as their combinations. Whatever decisions were to be made would affect to a large extent the outcomes of the testing process. It was necessary to establish a fair test for each of the three hypothetical models, so if the criteria were 'fuzzy' or loosely defined then there could be a case of anything goes. This had to be avoided.

The next section discusses how a decision was made to formulate operational statements for each of the factors, in the three hypothetical models. The following account takes each hypothetical model in turn.

8.1.2 Designing a coding template for Hypothetical Model 1

In Model 1 as described in Chapter Six, Section 6.2, the two components in the 2 x 2 matrix are the transactional, task-giving component and the transformational, motivational support component. Let each component be characterised by two constructs as follows:

(i) Low transactional construct, F1

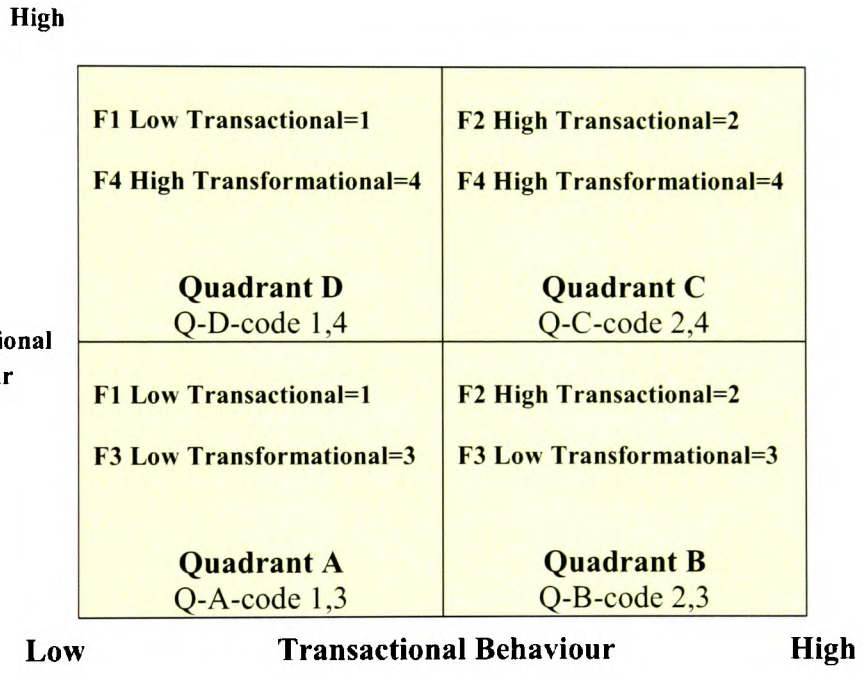
(ii) High transactional construct, F2

(iii) Low transformational construct, F3

(iv) High transformational construct F4

Then I decided to give each of the above four constructs a numerical code to facilitate the identification of empirical fragments in the e-moderator statements Hence the numerical coding became F1=1, F2=2, F3=3 and F4=4. A diagrammatic representation is shown below in Figure 8.1

Figure 8.1 Codes in Matrix Model 1 for Pedagogical Variation in Online Teaching



Again, each quadrant is characterised by a 2-digit code; quadrant-A (1,3), quadrant-B (2,3), quadrant C (2,4) and quadrant D (1,4). In a similar way I discuss how the coding template was designed for Hypothetical Model 2 in the next section.

8.1.3 Designing a coding template for Hypothetical Model 2

In Model 2 as described in Chapter Six, Section 6.3, the two components in the 2 x 2 matrix are the collaborative capability component and the knowledge construction ability component. Let each component be characterised by two constructs as follows:

(v) high- e-learner collaborative capability construct; F5

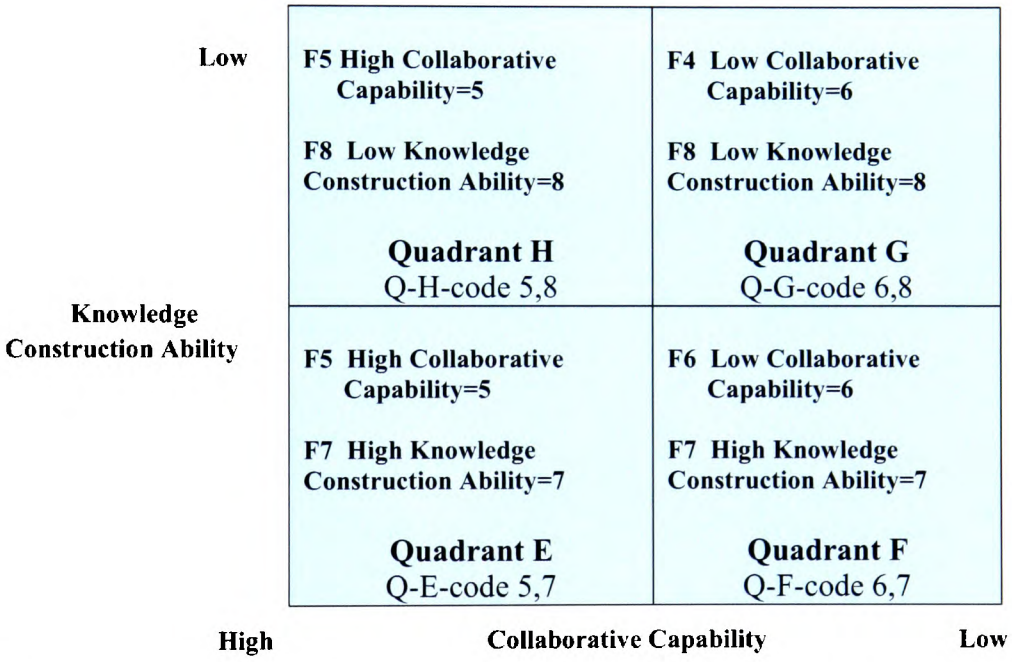
(vi) low- e-learner collaborative capability construct; F6

(vii) high- e-learner knowledge construction ability construct, F7;

(viii) low- e-learner knowledge construction ability construct.F8

Again I decided to give each of the above four constructs a numerical code to facilitate the identification of empirical fragments in the e-moderator verbatim statements Hence the numerical coding became F5=5, F6=6, F7=7 and F8=8. A diagrammatic representation is shown below in Figure 8.2

Figure 8.2 Codes in Matrix Model 2 for Pedagogical Variation in Online Learning



Each quadrant is characterised by a 2-digit code; Quadrant E (5, 7), Quadrant F (6, 7), Quadrant G (6, 8) and Quadrant H (5, 8). In a similar way I discuss how the coding template was designed for hypothetical Model 3 in the next section.

8.1.4 Designing a coding template for Hypothetical Model 3

In Model 3 as described in Chapter 5, Section 5.5, the two components in the 2 x 2 Matrix Model 1 and the two components in the 2 x 2 Matrix Model 2 are merged. Table 7.3 shows the codes used to identify the contributing constructs in Model 1 and Model 2.

Table 8.1 Coding Identifiers for Model 1 and Model 2 Constructs

Matrix Model 1 Contributing Constructs				Matrix Model 2 Contributing Constructs		
Factor-ID	Description	Code		Factor-ID	Description	Code
F1	Low-Task Giving	1		F5	High Collaborative Capability	5
F2	High-Task Giving	2		F6	Low Collaborative Capability	6
F3	Low-Motivational Support	3		F7	High Knowledge Construction Ability	7
F4	High-Motivational Support	4		F8	Low Knowledge Construction Ability	8

Each quadrant, therefore, by the merger, is characterised by a four-digit combination as shown below:

Figure 8.3 Codes in Matrix Model 3 for Pedagogical Variation in Online Teaching and Learning

F1 Low Transactional **F4 High Transformational** **F5 High Collaborative capability** **F8 Low Knowledge Construction ability** **Quadrant DH** Q-DH-code 1,4,5,8	**F2 High Transactional** **F4 High Transformational** **F6 Low Collaborative capability** **F8 Low Knowledge Construction ability** **Quadrant CG** Q-CG-code 2,4,6,8
F1 Low Transactional **F3 Low Transformational** **F5 High Collaborative capability** **F7 High Knowledge Construction ability** **Quadrant AE** Q-AE-code 1,3,5,7	**F2 High Transactional** **F3 Low Transformational** **F6 Low Collaborative capability** **F7 High Knowledge Construction ability** **Quadrant BF** Q-BF-code 2,3,6,7

The numerical coding schemes for the three hypothetical Matrix Models 1, 2 and 3. have been completed after reaching this stage. (Appendices B4 and B5)

The next step was to create the actual operational items that were to be matched with fragments in each unit of analysis i.e. each e-moderator verbatim statement (n=392). The actual designs for the coding templates containing descriptive identifiers for every possible occurrence that may be found in the e-moderator verbatim statements had to be accounted for to make a fair test to establish the degree of corroboration, using the empirical data for comparison. In the next section I describe and explain how I managed to work out the

criteria for matching selected fragments of e-moderator verbatim statements to the numerical codes identifying the factors underpinning the three hypothetical models.

8.2 Developing Operational statements to identify the eight constructs underpinning Matrix Models 1, 2 and 3 with empirical data

At this stage of the research it became evident that a strategy could be operationalised using the carefully designed coding sheets. It was a realistic means of identifying, in a descriptive process, the eight constructs underpinning the respective hypothetical models the better the matching process to the empirical data. The process meant taking clear decisions, without faltering and keeping to the strict coding template items. There were certain fragments of empirical data which had a 'good fit' and some that did not. These were put aside.

Chart 8.1 Design of the Coding Template for Constructs F1 and F2

Use any of the following 'events'- tasks/activities/e-tivities/things to do/ exercises/work/task-giving	
F1 Low Transactional=**1** e-moderator Criteria	F2 High Transactional=**2** e-moderator Criteria
+ any of the following qualifiers- Little/few/small number/small amount/ not so many/small array/ sparse/scant number/handful less fewer /least number of/least amount of N.B. **A qualifier must be present for every 'event'** **Acceptable phrases/sentences** No need for giving lots to do/without intervention e-learners generate own work so little need for many e-tivities I don't give them many tasks I don't need to provide so many activities It's better to keep to few/sparse/scant number of activities	**+ any of the following qualifiers** Many/numerous/several/umpteen/large array, number, amount /ample/plenty/lots of/heaps of loads of /more/greater number, amount of /masses N.B. **A qualifier must be present for every 'event'** **Acceptable phrases/sentences** I have to give e-learners as many tasks as I can I find it useful to stretch the imagination/give lots to do Too few tasks create boredom **Allow**: implications that - *Detailed* archiving provides resources about online tasks for easy access(indirect task-giving)

Chart 8.1 illustrates the coding template for factors F1and F2 contributing to the transactional component in Matrix Model 1 Some examples of empirical data (i.e. e-moderator statements) collected include constructs F1 and F2 and are coded respectively, F1=1 and F2=2 as shown in Table 8.2

Some examples of empirical data (i.e. e-moderator statements) collected include constructs F1 and F2 and are coded respectively, F1=1 and F2=2 as shown in Table 8.2 below.

Table 8.2 Examples of empirical data matching criteria for constructs F1 and F2

Data Analysis		Coding-1	Coding-2
Record No.	Participant	Transactional-Low construct	Transactional-High construct
22	**eM09**	*- a chance to sort out misunderstandings.[1] than to give more tasks*	*- several online tasks[2]*
26	**eM25**		*- a lot of clear definitions[2]/concepts / ideas.* *- expect lots of challenges from me[2]*
35	**eM27**	*- recombining subject-based ideas in fewer tasks[1]*	*- detailed archiving[2]*
45	**eM26**	*- I don't intervene,[1,3] too much"*	*- Archiving (detailed recording of outcome)[2]*
52	**eM21**	*- without intervention[1,3].*	*- I scaffold a lot with many tasks[2]*
59	**eM15**	*- few, simple suggestions and explanations[1]*	*- I notice that the more inputs [2](knowledge construction)I provide*
75	**eM23**	*- I tend to scaffold little by little[1]* *-I like to let them get on with it [1] and keep in the background"*	*-I like to let them get on with it [1] and keep in the background"*
76	**eM27**	*. Sometimes task-overload [1]defeats the object of learning.*	*--I post a lot of e-tivities[2]*
81	**eM22**	*--I only need give little guidance[1]*	*- I can be flexible in task-giving (sometimes minimal)[1]*
82	**eM23**	*-. I don't need to give so many tasks[1]"*	*- I tend to keep the momentum with lots[2]of appropriate tasks.*
85	**eM24**	*- few Simple tasks[1]*	*- Lots of 'innovative' e-tivities help[2]*

In a similar way charts and tables were drawn up for (i) constructs F3 and F4 (ii) F5 and F6 and (iii) F7 and F8. These are included in Appendix B4 and Appendix B5.

8.3 After coding the fragments in the empirical data

In the set of e-moderator statements (n-392), each statement was taken as a unit of analysis, for the identification of fragments in the statements which matched any of the criteria on the coding templates (Appendices B4 and B5). For Models 1 and 2, fragments which paired together according to their numerical code could then be allocated to the respective quadrant as show below. A combination of constructs giving a 2-digit numerical code would be identifiable as belonging to one of the eight quadrants as shown below:

Matrix Model 1 Quadrants A (13) B (23) C (24) D (14)

Matrix Model 2 Quadrants E (57) F (67) G (68) H (58)

A tally count was set up for the eight quadrants and the tally increased by an increment of +1 every time a matching pair was found.

At the same time the coded fragments in the e-moderator statements were inspected to identify whether there were any that represented a combination of constructs giving a 4-digit numerical code which would match up to one of the four quadrants in Matrix Model 3 as shown below:

Matrix Model 3 Quadrants AE (1357) BF (2367) CG (2468) DH (1458)

Again, a tally count was set up for the four quadrants and the tally was increased by an increment of +1 every time a matching set of four digits was found.

Inevitably in any such empirical data there will be statements that do not fit the coding criteria, for some reason or other.

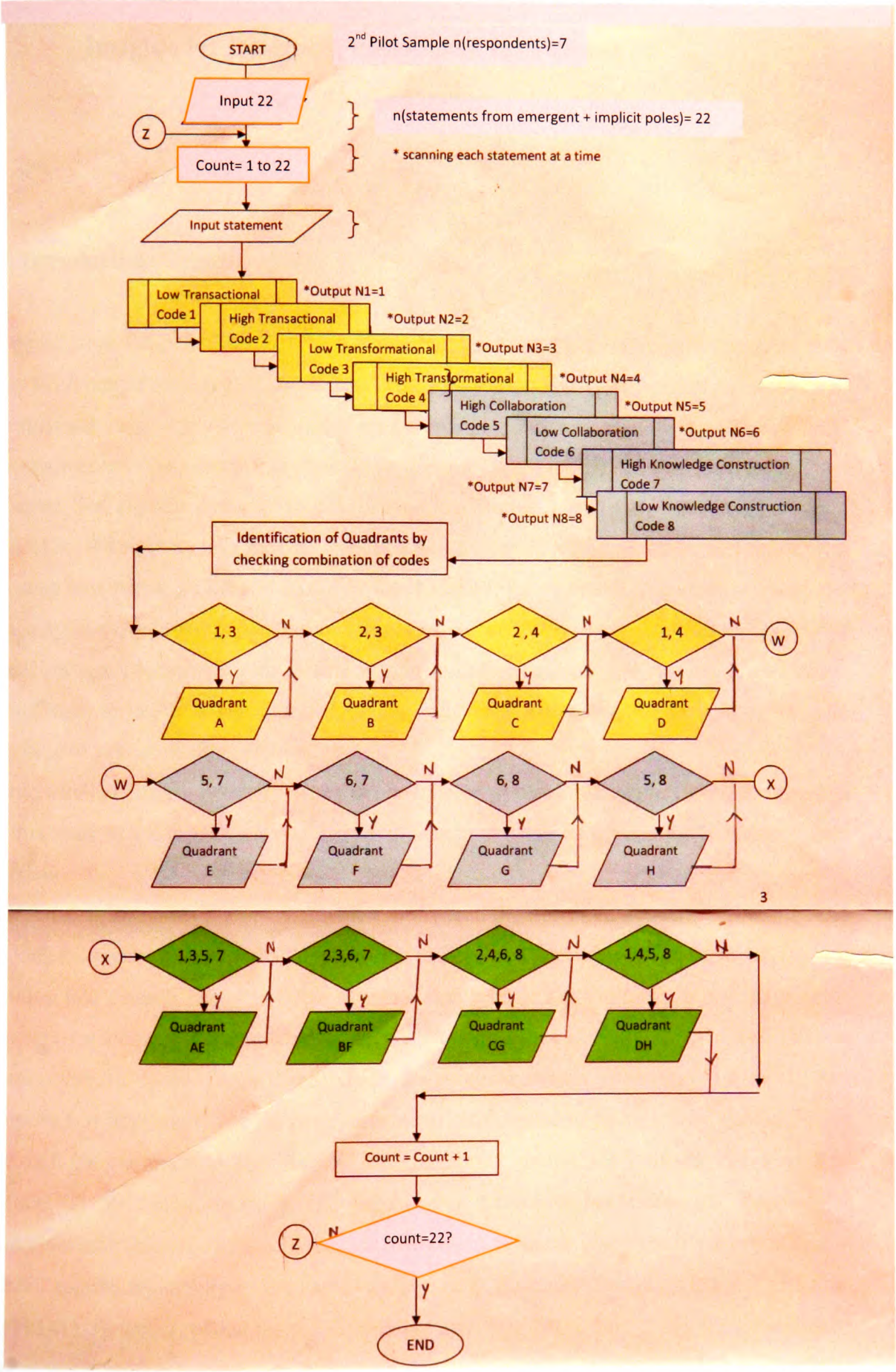
8.4 Summary

In this chapter the purpose of collecting statement from e-moderators by adapting ideas from personal construct psychology for corroborating the three hypothetical models has been discussed. The coding templates were designed using operational statements according to the definitions of the variables underpinning each of the three models so that fragments from e-moderator statements could be coded accordingly using the method of content analysis. The intended outcomes of this process were expected to show that the emerging hypothetical matrix Model 3 for *Pedagogical Variation* is testable; that it can stand up to 'public' scrutiny (Dooley, 1984).

The annotated flowchart on the next page illustrates the data analysis process e.g. from 2nd Pilot Sample (n=7). Note: Two pilot samples were eventually used before collecting data from a representative research sample of e-moderators (n=17). The first Initial pilot sample (n=3) was successful in that the three participants were able to complete the procedures for the choice of triads and process of selecting two elements that were the same and the third different one (Appendix D1). Their explanations of their selection of bi-polar constructs led to the corroboration of Models 1 and 2. The 2nd Pilot Sample (n=7) led to the corroboration of all three Models (D2).

The next chapter, Chapter Nine, discusses the methodology implemented for the hypothesis testing procedure for the hypothetical frameworks for Models 1, 2 and 3.

Figure 8.4 Annotated Flowchart of the data analysis process (2nd Pilot Sample (n=7))



Chapter Nine

Insights for Designing a Research Instrument for Hypothesis Testing

9.0 Introduction: Empirical Study 2

A quote from Popper (2002:24) ". . . *No matter how intense a feeling of conviction it may be, it can never justify a statement. Thus, I may be utterly convinced of the truth of a statement; certain of the evidence of my perceptions; overwhelmed by the intensity of my experience; every doubt may seem to be absurd*", sums up the research experience.

Chapter Six explained the conceptualisation of Model 1 and the conceptualisation of Model 2. When these two models, Model 1 and Model 2, were merged a third model was creating as a result, i.e. Model 3, the *Pedagogical Variation* model for online learning and teaching in asynchronous discussion forums. A researcher's conviction that an innovative model brings into being an invaluable insight to online learning and teaching, however, is insufficient to justify its meaningfulness and relevance as a contribution to knowledge in the field of pedagogical epistemology.

"Overwhelmed by the intensity of my experience" (Popper, 2002:24) relates to the urgency at this stage of the research investigation, to design a means of testing the three conceptual Models.

This chapter discusses the insights which influenced the design of a research instrument to test the three conceptual models. Hypothesis testing, as a way of introducing reliability and validity into a study, requires frequently repeated tests or replications. "When judging the quality of a conceptual framework . . . very limited guidance is available" (Holweg and van Donk, 1999:3). In this Empirical Study 2, designing a research instrument that was fit-for-purpose was important. The research instrument also needed to be able to be used in future research programmes to test further the conceptual model for *Pedagogical Variation* (Model 3) for online learning and teaching in asynchronous discussion forums. An important characteristic of a reliable test instrument is that it gives consistent results, that when "applied repeatedly to the same object, yields the same results each time" (Babbie, 2004:141). However, whilst the test instrument is to be reliable, the testing for reliability of

the conceptual framework for Model 3 would not be appropriate for this investigation because of the relatively small sample size and the time constraint for doing one survey rather than several. Many issues crop up with respect to confirming reliability - regarding sample size, (especially adopting a split-half reliability test), cultural differences of e-moderators and their preference to teaching styles online/offline, differing locations of respondents and number of years of professional experience, for example.

A decision was made that it would be more useful to consider the validity of the hypothetical model, i.e. construct validity, by adopting a measure that reflects as accurately as possible what the conceptual model is meant to identify. It was known that a test instrument could not show conclusive evidence of validity because "construct validity can no more be definitively and finally established than theories can be proved" (Dooley, 1984:69)

Popper (2002:17) argues that all theoretical statements "must be 'conclusively decidable' . . . that their form must be such that to verify them and to falsify them must both be logically possible". Willig (2001:4) concludes that Popper's hypothetico-deductivism "works by looking at disconfirmation and falsification" and so "we can find out which claims are not true and by a process of elimination of claims we can move closer to the truth". This is no simple task. However, Cook (1983) concludes that falsification "does promote a self-conscious critical attitude that is at least congruent with logic". Another assumption of falsification is that "all relevant alternative explanations have been identified" in the theory which is being tested. Campbell and Stanley (1963:5-6) point to a number of issues relating to "internal invalidity" or "internal validity threats". One of the most relevant threats to this investigation is the threat of "selection biases". In the data gathering stage for the corroboration of the three pedagogical models all the participants (n=27) came from the same university and had all taken the same e-moderating course offered by the university, but in different e-learning groups at different times of the year. They all had a minimum of three years' experience as online e-moderators. For this stage of the research, I aimed to collect data from a different group of experienced e-moderators, who are not on the same university campus but who are more widely dispersed geographically to obtain an 'unbiased selection of participants".

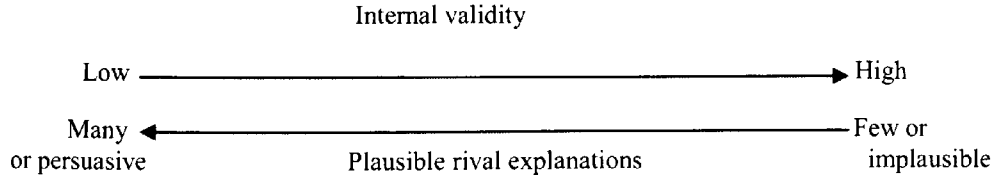
9.1 Reliability or Validity? - That is the question

Both reliability and validity are measures for qualitative research. A research instrument which measures validity is more important than one which measures reliability. This is because when an instrument measures high validity there must be high reliability. "If it (the measure) shows low validity, the object is misnamed and misleading, regardless of reliability" (Dooley, 1984:73). With insight to any potential difficulty where the research instrument testing validity does not measure the intended concept, I managed to define, clearly and as accurately as possible the components in the conceptual frameworks, so that there were no ambiguities in what the research instrument would be designed to measure, i.e. to test the validity of the components of the conceptual framework effectively.

Before moving on to the next section, I need to explain how, in the research design, I dealt with "the continuum of internal validity" (Dooley, 1984:125). A research design has high internal validity if it is tight. That is to say "that it has few holes out of which our confidence can be lost". Conversely, a leaky design has low internal validity, i.e. having many holes, because ". . . each hole or rival explanation is a threat to our confidence in the proposition that the independent variable causes the change in the dependent variable".

Figure 9.1 below (Dooley 1984:126) shows how the degree of internal validity is inversely proportional to the number of "unplugged" rival explanations. That is to say that the greater the number of plausible rival explanations the lower will be the degree of internal validity of a system and vice versa; the fewer the number of plausible rival explanations the greater the degree of internal validity of a system.

Figure 9.1 The **continuum of internal validity as a function of plausible rival explanations**



The goal for testing the conceptual framework was to identify as far as possible the degree of internal validity. That is to say to maximise the confidence that can be placed in the proposition that online teaching is situational, dependent on the characteristic learning behaviours of online learners. If there is no association of the independent variable (what e-learners are able to do online) and the dependent variable (what e-moderators do online) there would be no necessity to ascertain the degree of internal validity. This is discussed

further in Section 9.2.3 relating to the design of the research instrument for testing the conceptual framework, Model 3.

In the next section, I discuss and explain further, other criteria which I used for an initial evaluation for Model 3

9.2 Exploring Criteria for a good Conceptual Framework: Initial Evaluation of Model 3

In this section, I discuss six criteria (Holweg and van Donk, 1990:3-4) which are useful in carrying out an initial evaluation of the conceptual model for *Pedagogical Variation*, Model 3. The first criterion, selectivity, is discussed in the next section.

9.2.1 Selectivity:

"There should be a clear and logical justification why a conceptual model includes certain elements and excludes others." (Holweg and van Donk, 1990:3). This criterion of selectivity is also mentioned by Whetten (1989:491) who concludes that researchers should indicate ". . . compelling and logical justifications", while Siggelkow (2007:21) contends that if models ". . . were as complex as reality, they would not be useful at all".

The boundaries of the conceptual framework for Model 3 are clearly defined. There is no ambiguity with respect to the dimension described as e-moderator perceptions of what they do online. These dimensions relate to (i) task-giving (i.e. quantity of tasks) and (ii) motivational support (i.e. amount). No other variables at this level of description are used. At the same time, the conceptual framework also brings into focus e-moderator perceptions of what e-learners are able to do online, only in respect to another two variables, at this level of description (i) collaborative capability and (ii) knowledge construction ability. No other variables, at this level of description are used.

The justification for this selectivity of variables is underpinned by the rationale of the investigation, namely is online teaching situational with respect to e-learner behaviour? In other words are e-moderator teaching behaviours dependent on e-learner online behaviours? Put in a different way. Do e-learner behaviours online influence the way e-moderators teach online?

9.2.2 Use of the fewest possible variables

Holweg and van Donk (1990:3) contend that ". . . as few variables as possible should be used, restricting the model to the vital few." Dooley (1984:37) states that the "efficiency" of a theory or explanation "makes use of the fewest constructs and relationships necessary to explain the phenomenon of interest."

The "phenomenon of interest" Dooley (1984:37) in the core of the conceptual framework is the relationship between the online behaviours of e-moderators with respect to the online behaviours of their e-learners. The conceptual framework shows this relationship by the implementation of four pertinent online behaviours, two belonging to e-moderators and two belonging to e-learners. On reflection, a problem was noticed here in balancing the need for the fewest use of variables and yet their comprehensive use. The following section discusses the comprehensive use of variables more fully.

9.2.3 Specificity: clear definition of variables

Holweg and van Donk (1990:3) conclude that "...a framework should be precise and clear, with clear boundaries as to what it covers, and what it does not cover."

Babbie (2004:125) provides another useful definition for specification, i.e. "...specification is the process through which concepts are made more specific." Yet again Berg (2004:16) gives a warning that "vague and unclear definitions create enormous problems. Specificity is critical when conducting research".

This was viewed as an important criterion because it is by operational definitions that it would be possible to measure the validity of the conceptual Model 3. This can be achieved by the inclusion of descriptors which qualify each variable as two constructs "high or low" thereby giving descriptive indicators (F1 to F8) as shown below:

(i)	Transactional (task-giving) behaviour	(a) F1-Low (b)F2-High
(ii)	Transformational (motivational support) behaviour	(c) F3-Low (d)F4-High
(iii)	Collaborative capability behaviour	(e) F5-High (f) F6-Low
(iv)	Knowledge construction ability behaviour	(g) F7-High (h) F8-Low
(v)		

9.2.4 Comprehensiveness: an all-in-one framework

Holweg and van Donk (1990:3) state that ". . . considering the intention of the framework, all elements should be taken into account that are needed to support any claims made" Whetten (1989) contends that the requirements of a theory are such that the relationship between the various parts is self-sufficient.

The model for the conceptualisation of *Pedagogical Variation*, represented by a 2 x 2 matrix format, takes into consideration all dimensions of the conceptualised parts. A combination of the eight constructs, as discussed in Part One, Chapter Six, Section 6.5, is illustrated by Diagram 6.4 showing how Matrix Model 3 for *Pedagogical Variation* is based on the empirical data from e-moderator perceptions of what they do and what e-learners are able to do online (i.e. Empirical Study 1)
In using this conceptual model, it is proposed that online teaching may be seen to be situational where e-moderator teaching behaviour is influenced by e-learner online learning behaviour. In other words, online e-learner behaviour influences online teaching behaviour.

9.2.5 Novelty (or risk): Creating a new paradigm

Holweg and van Donk (1990:4) state that "... it is not sufficient just to repeat what others have done . A framework should have its own conjecture and be surprising in offering new insights, which often involves negating an existing and accepted theory"
Other researchers (Davis, 1971 and Siggelkow, 2007) comment on new conceptualisations as outcomes from previous theoretical assumptions.

During a critical review of the research literature, it was noted that there were many ways in which theoretical online learning and teaching concepts were visualised. (Part One, Chapter Four) Some diagrammatic illustrations include concentric circles, others Venn diagrams, hierarchical rectangles, interrelated charts, stepwise and ladderwise conceptualisations. Nowhere in the research literature for online learning and teaching, as yet, was there found a graphical illustration using the format of a 2 x 2 matrix except for online course design (Belfer and Morgan, 2007) and for face-to-face classroom teaching in adult education (Grow,1991).

It was a risk that was undertaken, because through a 2 x 2 matrix format it became possible to identify in a unique way how the variables that were selected for online learning and teaching offered, by their combination, an explanation for situational learning and teaching.

Chapter Thirteen discusses the outcomes of using the Research Instrument to test the validity and falsifiability of the Conceptual design for Model 3.

9.2.6 Meaning: what relevance is the conceptual framework in practice?

Holweg and van Donk (1990:4) use the question "...does the framework present us with an instrument that helps understand an existing, real-life managerial problem?" to highlight a sixth criterion for a good theory. The relevance to a practical problem seems to be the point of greatest agreement in the literature (Whetten, 1989 and Schmenner, 2009).

It was contend that the conceptual design for Model 3 is of significance in the development of a theoretical perspective that is based on the notion of situational teaching and learning online. Garrison and Anderson (2003:28) conceptualise an online e-learning framework which incorporates three components, namely "social presence, teacher presence and cognitive presence" in a Venn diagram (Chapter Four). This was found to be a useful interpretation for what goes on, in their view, in online learning spaces. The pedagogical implication in their model focuses on "appropriate teaching presence . . . for supporting an intellectually challenging yet respectful and a personally, yet focused community of inquiry" (Garrison and Anderson, 2003:50)

Model 3 provides an alternative conceptual design for *Pedagogical Variation* which takes into consideration not only teaching presence per se but the varying degree of teacher behaviour to match the varying degree of e-learner cognitive and collaborative behaviour manifested online. Garrison and Anderson (2003:70) give a warning that "...The risk in e-learning is that the proper educational and intellectual climate may be lost with anomie resulting". Grow (1991:141) concludes that "...Nearly any teacher can teach in more than one style". In this light, it is proposed that the innovative presentation of the conceptual *Pedagogical Variation* model is a contribution to the understanding of matching what e-moderators do online with what e-learners are able to do online. Kuhn (1970:23) reminds us that "Paradigms gain their status because they are more successful than their competitors in solving a few problems that the group of practitioners has come to

recognize as acute. To be more successful is not, however, to be either completely successful with a single problem or notably successful with any large number. The success of a paradigm is at the start largely a promise of success discoverable in selected and still incomplete examples." This quote emphasises the need to be courageous in presenting a conceptual framework which is open to critical scrutiny and evaluation from practitioners in the field. By developing the Research Instrument for Evaluation of the *Pedagogical Variation* model, it became necessary to ensure that it would test what it is meant to test (i.e. whether e-moderators agree, or not, with the principle of teaching according to their e-learners' learning characteristics regarding their collaborative capability and knowledge construction ability.

9.3 Summary

This chapter began by considering how best to evaluate the conceptual design for Model 3, in terms of reliability and validity. From Babbie's (2004) explanation of reliability and Dooley's (1984) descriptive analogy of a bucket with holes, to explain internal validity, the understanding of these two measures for evaluating a conceptual framework became sharper. Dooley's (1984:126) diagram illustrating internal validity with respect to 'plausible explanations and plausible rival explanations' provided a way of identifying outcomes obtainable from a hypothesis testing instrument.

Furthermore, the six criteria for assessing whether a conceptual model is good (Holweg and van Donk, 1990) provided greater insight into checking critical factors embedded in the conceptual design for Model 3. By carrying out a brief analysis of the conceptual model against the six criteria, the researcher gained greater confidence to design an appropriate hypothesis testing instrument, which is explained in the next chapter, Chapter Ten.

Chapter Ten

Hypothesis Testing Methodology

10.0 Empirical Study 2

The design of an appropriate systematic research instrument was underpinned by "the ability to reproduce comparable data by subsequent researchers "(Berg 2004:7) whereby the objectives would give a clear guide to the steps involved. Six objectives are listed below for the development of a Hypothesis Testing Instrument:

(i) To identify the key dimensions in the conceptual Model 3;

(ii) to design a research instrument for testing Model 3;

(iii) to determine a sample population;

(iv) to design an appropriate method for using the testing instrument;

(v) to carry out a systematic analysis of the data;

(vi) to interpret the outcomes as measures of refutation and corroboration;

In the next section I bring into focus the key dimensions of the conceptual model to be tested

10.1 What are key dimensions in the conceptual Model 3?

As explained in Chapter Six, Section 6.4, the conceptual framework for Model 3 consists of eight constructs (F1 to F8). The first four of these (F1-F4) originated in the conceptual framework for Model 1 (Chapter Six, Section 6.2) and the next four constructs (F5-F8) originated in the conceptual framework for Model 2 (Chapter Six, Section 6.3). In each of these two models, the respective constructs are independent. Neither of the transactional constructs, F1 or F2 is dependent on the transformational constructs, F3 or F4 or vice versa in Model 1. Similarly neither of the collaborative capability constructs, F5 nor F6 is dependent on the knowledge construction ability constructs, F7 or F8 or vice versa in Model 2. However a different relationship is seen to occur in Model 3. The four key dimensions are:

(i) Transactional task-giving behaviour;

(ii) transformational motivation support behaviour;

(iii) collaborative capability behaviour;

(iv) knowledge construction ability.

The first two dimensions reflect e-moderator perceptions of what they do online and the next two dimensions reflect e-moderator perceptions of what e-learners are able to do online in asynchronous discussion forums.

When Model 1 and Model 2 are superimposed, a kind of metamorphosis occurs where the dimensions of Model 2 may be said to affect the dimensions in Model 1. That is to say, Model 3 shows how e-moderator behaviour in terms of transactional and transformational behaviour adapts to match e-learner behaviour regarding collaborative ability and knowledge construction ability. From this dynamic viewpoint e-moderator behaviour becomes dependent on e-learner behaviour, so that we now have Model 1 constructs F1-F4 as dependent variables, dependent on constructs F5-F8 in Model 2. Hence constructs F5-F8 now become independent variables when viewed in the merger of Model 1 and Model 2.

The situational nature of the key underpinning assumptions in Model 3 is summarised below:

(i) When e-peers are highly collaborative and are highly able to construct knowledge (Quadrant E) then the e-moderator role will be to provide few tasks without the need for a lot of motivation (Quadrant A).

(ii) When e-peers are less collaborative and highly able to construct knowledge (Quadrant B) then the e-moderator role will be to provide more tasks without the need for a lot of motivation (Quadrant F)

(iii) When e-peers are less collaborative and less able to construct knowledge (Quadrant G) then the e-moderator role will be to provide more tasks with a lot of motivation (Quadrant C)

(iv) When e-peers are more collaborative and less able to construct knowledge (Quadrant D) then the e-moderator role will be to provide less tasks with a lot of motivation (Quadrant H)

In Model 3 there is an inbuilt flexibility, due to its underlying situational nature. This dynamic aspect is an important characteristic. For example, an e-learner initially in the situation conceptualised in Quadrant CG may move into the situation conceptualised in Quadrant DH and vice versa. An e-learner initially in the situation conceptualised by Quadrant BF may move into the situation conceptualised in Quadrant AE and vice versa. An e-learner initially in the situation conceptualised in Quadrant AE may move into the situation conceptualised in Quadrant DH and vice versa. An e-learner initially in the situation conceptualised by Quadrant CG may move into the situation conceptualised in Quadrant-BF and vice versa. For example, an e-learner initially in the situation conceptualised in Quadrant CG may move into the situation conceptualised in Quadrant-DH and vice versa. . It would be also possible for an e-learner initially in the situation conceptualised in Quadrant AE to move into the situation conceptualised in Quadrant CG and vice versa and an e-learner

initially in the situation conceptualised in Quadrant BF to move into the situation conceptualised in Quadrant DH and vice versa.

In this way the development of the e-learner shifts the emphasis on the learning environment which best suits his/her progress. Whereas before, a student may be weak in knowledge construction, after experiencing learning in the situation conceptualised in Quadrant DH, their knowledge construction increases and the situation conceptualised in Quadrant AE may suit him/her more beneficially. This now means that the dynamics of Model 3 can change the dependency and independency of variables, i.e. those variables that were independent (collaborative capability and knowledge construction ability) become dependent and those variables that were independent (transactional behaviour and transformational behaviour) from the e-learner perspective. I emphasise e-learner perspective. This reciprocal causality underpins a dynamic, flexible characteristic for Model 3, a Model for Pedagogical Variation in online learning and teaching.

The situational nature of teaching is represented in the model for Pedagogical Variation whereby the four different quadrants offer students at different levels of development opportunities for self-development. Students are given a means to progress from one stage of development to another (Grow, 1991).

The next section, Section 10.2 provides an in-depth analysis of each of the four quadrants in Model 3. The purpose of this analysis is to determine the parameters that are to be evaluated by a hypothesis test instrument..

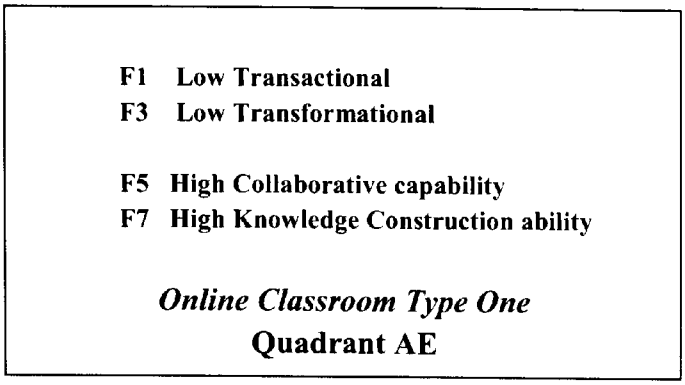
10.2 How is situated online teaching demonstrated in Model 3?

When examining the four quadrants in the conceptual Model 3 (Chapter Six) a different situation arises in each quadrant AE, BF, CG , and DH respectively. The four different situations are discussed in the next four sub-sections.

10.2.1 An examination of Quadrant AE: Online Classroom Type One

Quadrant AE, in Figure 10.1 below shows the two dimensions of e-learner collaborative capability and knowledge construction ability characterised by constructs, F5 and F7 respectively, i.e. e-peers are highly collaborative and also at the same time have high knowledge construction ability.

Figure 10.1 Online Classroom Type One: Combination of constructs

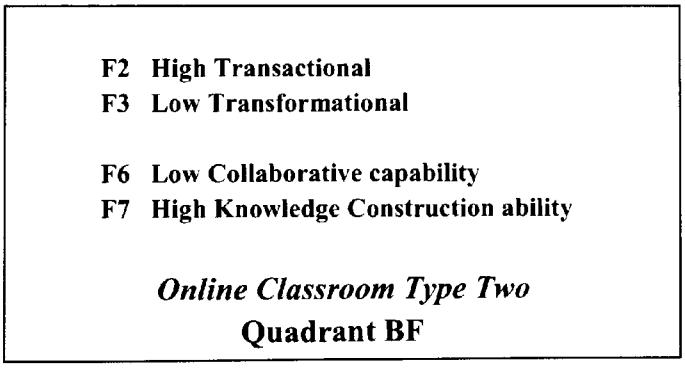


To match this situation, e-moderator behaviour is regarded as low in task-giving, F1 and low in motivational support, F3. The pedagogical assumption is that e-moderator intervention would not be essential when a learning community is progressing with knowledge construction, generating new ideas amongst themselves through collaborative initiatives.

10.2.2 An examination of Quadrant BF: Online Classroom Type Two

Quadrant BF, in Figure 10.2 below, consists of two dimensions, namely e-learner collaborative capability and knowledge construction ability characterised by constructs, F6 and F7 respectively, i.e. e-peers exhibit little collaborative capability yet at the same time show high knowledge construction ability.

Figure 10.2 Online Classroom Type Two: Combination of constructs

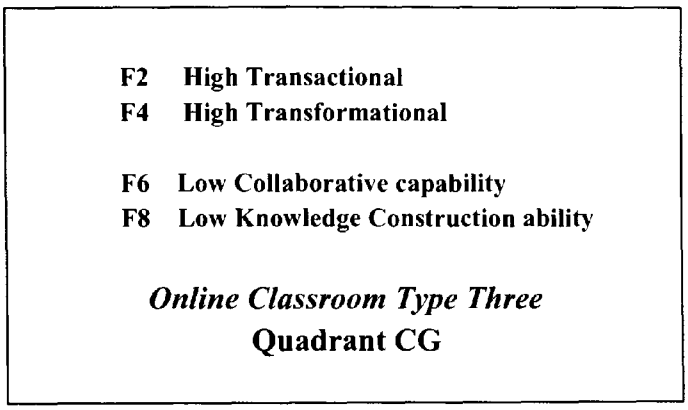


To match this situation, e-moderator behaviour is regarded as high in task-giving, F2 with little necessity for motivational support, F3. The pedagogical assumption here is that e-moderator intervention would not be essential with respect to motivational support when independent, self-directed e-learners progress with a lot of knowledge construction. In this situation e- learners are unable to collaborate effectively yet they would thrive on a lot of tasks.

10.2.3 An examination of Quadrant CG: Online Classroom Type Three

Quadrant CG, in Figure 10.3 below, consists of two dimensions, namely e-learner collaborative capability and knowledge construction ability characterised by factors, F6 and F8 respectively, i.e. e-peers exhibit little or no collaborative capability and at the same time show little or no knowledge construction ability.

Figure 10.3 Online Classroom Type Three: Combination of constructs

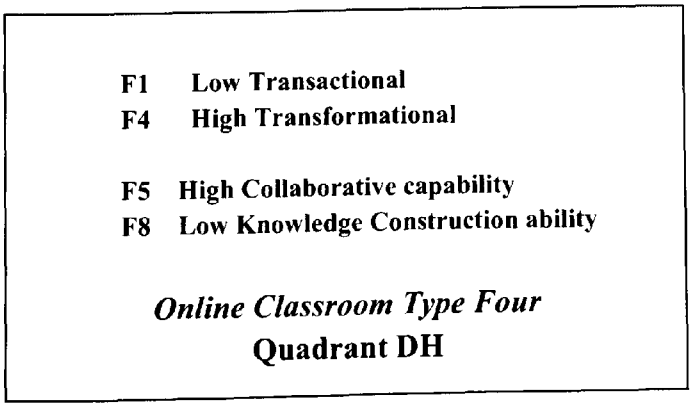


To match this situation, e-moderator behaviour is regarded as high in task-giving, F2 with a lot of motivational support, F4. The pedagogical assumption here is that e-moderator intervention is very important to bring e-learners online. Some e-learners may be seen to be 'lurking' or 'shirking' their responsibility of participating in the online learning community. With a lot of motivational support and numerous appropriate activities, provided by an e-moderator, e-learners should be encouraged to make progress.

10.2.4 An examination of Quadrant DH: Online Classroom Type Four

Quadrant DH, in Figure 10.4 below, consists of two dimensions, namely of e-learner collaborative capability and knowledge construction ability characterised by factors, F5 and F8 respectively, i.e. whilst e-peers may exhibit strong collaborative capability, while at the same time they may show little or no knowledge construction ability.

Figure 10.4 Online Classroom Type Four: Combination of constructs



To match this situation, e-moderator behaviour is regarded as low in task-giving, F1 with a lot of motivational support, F4. The pedagogical assumption here, is that e-moderator intervention is very important to encourage e-learners who are struggling with key concepts. In this situation e-learners need a lot of motivational support with a few activities rather than to be inundated with too much to do.

In this section I have identified the four key dimensions and the relationship of the eight constructs in the conceptual framework for Model 3. In the next section I discuss and explain the ways in which I set about planning an appropriate research instrument to test the hypothetical framework of Model 3.

10.3 Initial Plan for Designing Research Instrument to Test Model 3

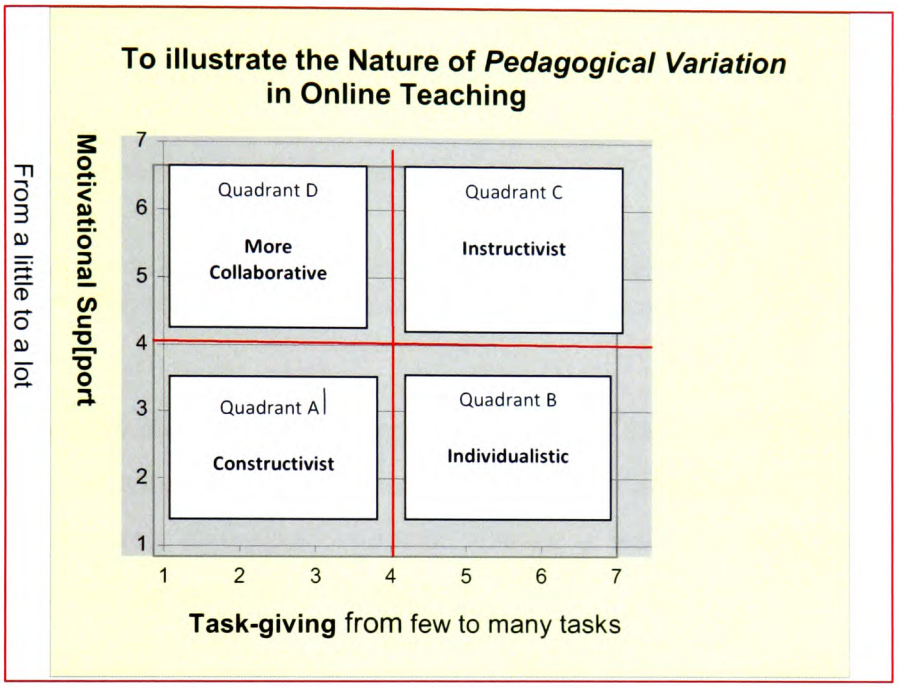
The design of the research instrument to test the degree of validity of the conceptual framework must take into account the specification of the research question if it is to measure what it is meant to measure.

The conceptual model for *Pedagogical Variation* is graphically represented in a 2 x 2 matrix with descriptors in each of the four resultant quadrants. It was necessary to obtain data which falsify or not (i.e. corroborate) the underlying assumption regarding the way e-moderator online teaching behaviour matches e-learner online learning behaviour. Several steps were taken to develop a strategy to investigate how best to design a research instrument to test Model 3. First of all the researcher set up a discussion about the conceptual framework with two colleagues, to find out, in an informal way, whether they were able to grasp an understanding of the conceptual model. After this informal trial, it was established that a simple way to look at designing a test instrument was to incorporate the illustration of the Matrix Model 1 (based on e-moderator perceptions of what they do online) and Matrix Model 2 (based on e-moderator perceptions of what e-learners are able to do online) and observe whether respondents could match them. A self-administered questionnaire format seemed to be appropriate, where respondents could take their own time to answer questions, rather than a face to face interview where immediate responses would be expected.

10.4 Questionnaire Design: Hypothesis Testing Research Instrument

The hypothetical Model 1 matrix is illustrated below in Figure 10.5. This conceptualization relates to e-moderator perceptions of what they do online in the teaching situation. (Chapter Six)

Figure 10.5 The Nature of *Pedagogical Variation* in Online Teaching



If this illustration were presented as source material, then questions could be framed to elicit the kind of e-learner group that would benefit from each of the four different online teaching styles found in each of the four quadrants (A-D inclusive).

The design of this research instrument had the underlying pattern of providing a clear description, basic statement, about the teaching style for which an open-ended response was required from the respondent. In this way the research instrument captured the respondent's contributions. Since there are four quadrants, statements were designed describing the teaching style in each of the four quadrants as follows:

Q.1 **Quadrant A** above shows an online teacher who is providing very little task-giving and very little motivational support in a discussion forum.

What kind of e-learning group would this be appropriate for?
Please give your answer with reasons in the box below:

Q.2 **Quadrant B** above shows an online teacher who is providing as much task-giving as possible with little motivational support in a discussion forum.

What kind of e-learning group would this be appropriate for?
Please give your answer with reasons in the box below:

Q.3 **Quadrant C** above shows an online teacher who is providing as much task-giving as possible and much motivational support in a discussion forum.

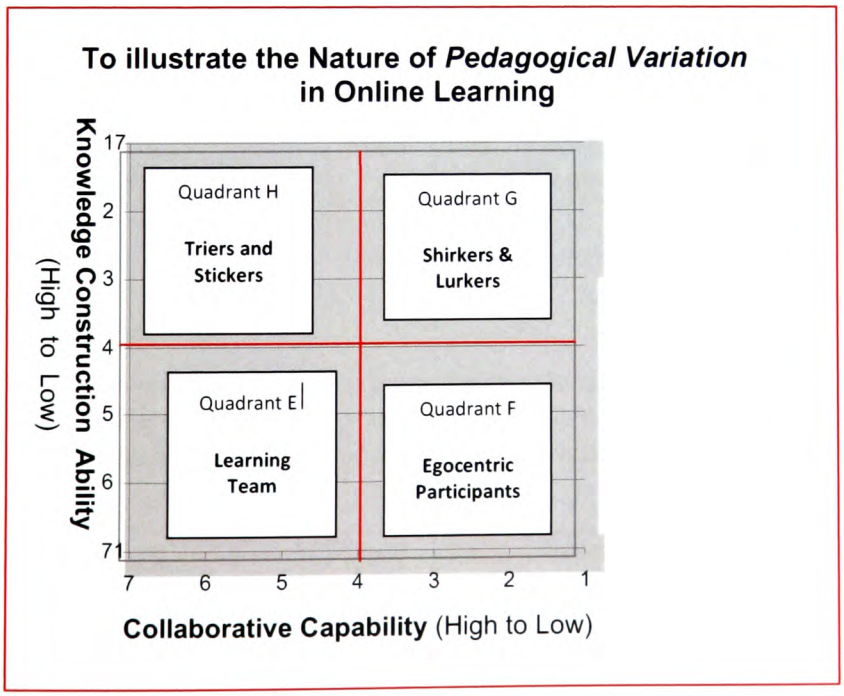
What kind of e-learning group would this be appropriate for?
Please give your answer with reasons in the box below:

Q.4 **Quadrant D** above shows an online teacher who is providing fewer tasks and more motivational support in a discussion forum.

What kind of e-learning group would this be appropriate for?
Please give your answer with reasons in the box below:

This was then followed by looking at the conceptual framework for Model 2, based on e-moderator perceptions of what e-learners are able to do online as illustrated in Figure 10.2 below. The respondents were then asked to decide whether it was possible to match the quadrants in Model 1 with the quadrant in Model 2.

Figure 10.6 The Nature of *Pedagogical Variation* in Online Learning



The next four questions then asked respondents to match the quadrants from Model 1 and Model 2, again by providing explicit, basic statements, as follows:

T.1 **Quadrants A and E.**

Imagine a teacher who is providing very little task-giving and very little motivational support in a discussion forum and e-learners who have a high collaborative capability and high knowledge construction ability. What kind of a match would you say this is?

Please tick appropriate box

Good	Bad	Doesn't matter	Don't know

T.2 **Quadrants B and F**

Imagine a teacher who is providing as much task-giving as possible with little motivational support in a discussion forum and e-learners who have a low collaborative capability and high knowledge construction ability. What kind of a match would you say this is?

Please tick appropriate box

Good	Bad	Doesn't matter	Don't know

T.3 **Quadrants C and G**

Imagine a teacher who is providing as much task-giving as possible and much motivational support in a discussion forum and e-learners who have a low collaborative capability and low knowledge construction ability. What kind of a match would you say this is?

Please tick appropriate box

Good	Bad	Doesn't matter	Don't know

T.4 **Quadrants D and H.**

Imagine a teacher who is providing fewer tasks and more motivational support in a discussion forum and e-learners who have a high collaborative capability but little knowledge construction ability. What kind of a match would you say this is?

Please tick appropriate box

Good	Bad	Doesn't matter	Don't know

10.5 Pre-Testing the Draft Questionnaire

An important stage before releasing a questionnaire to a sample population is to pre-test to ensure that it is understandable and error-free.

A draft questionnaire, was initially handed to five colleagues, familiar with e-moderating. Two amendments were made. A typo-error was discovered and an additional box "doesn't matter" was seen to be appropriate. Other than these minor adjustments, the questionnaire was deemed to reflect a data collection instrument that would give a fair test.

10.6 Determining a sampling strategy

Berg (2004:34) concludes that "the logic of using a sample of subjects is to make inferences about some larger population from a smaller one – the sample".
So what sampling strategy would be appropriate, considering the fact that e-moderators are very busy people, some of whom may not only take time to teach online in online classrooms, but also be pre-occupied with face to face teaching in traditional learning environments.? In a previous research investigations (Rogers, 2004) it was found that snowball sampling can be an effective means of gathering data from "difficult to reach populations" (Lee 1993:36). Four people were found to start the snowball sampling procedure. Then by asking them whether they could name contacts whom they knew would also be able and willing to participate in the research, provided the opportunity to increase the sample population. All participants had a minimum of three years' experience as e-moderators.

10.6.1 Distribution of Questionnaires

Since the sample population comprised online teachers, it seemed appropriate to send out the questionnaires by email. Should there be any question of preferred anonymity, then respondents would have the option of using snail mail. There were no ethical issues to contend with since all participants had previously agreed to participate with the understanding that they had the choice to withdraw at any time. I also reaffirmed the nature of confidentiality in using the data specifically for the current research.
An advantage of this method of distribution is that it is relatively economical, without hard copies to be circulated while at the same time there is the ease of chasing up 'late returns' and sending out extra attachments should some get lost or damaged. An additional advantage which I found very beneficial and time saving is that the responses were typed

in the answer boxes electronically and this made the data collection much easier when the time came to carry out the analysis.

10.7 Summary

At the beginning of this chapter, notions of what makes a good conceptual model with respect to online learning and teaching in asynchronous discussion forums were explored. Popper (2002) provided insight to the nature of how ideas about the world become conceptualised and open to testing. In this light, conceptual frameworks are tentative, provisional hypothetical notions which when put to the test may give way to more reliable hypothetical frameworks. Babbie's (2004) definition of conceptualisation led the researcher to reflect on the ways in which the conceptualisation of the three models could take place and how to operationalize underlying constructs with clear definitions (Berg, 2004).

Two hypothetical models relating to e-moderator perceptions of what they do online (Model 1), e-moderator perceptions of what e-learners are able to do online (Model 2) were merged giving rise to a third model (Model 3) for *Pedagogical Variation* which is based on the concept of situational learning and teaching online. In this narrative, the researcher reflected on the way in which a method was found to corroborate the emerging models from empirical data obtained, borrowing ideas from personal construct psychology (Kelly, 1955)

When these stages in the research were completed, it was useful to identify the dimensions and associated constructs underpinning each quadrant in Model 3 in terms of matching e-moderator perceptions of what e-learners are able to do with perceptions of what they (e-moderators) do online. This formed the basis for the investigation, as to how Model 3 could be tested. The research approach adopted, known as *"theory before research"* (Nachmias and Nachmias 1992:46) is also one that Popper (2002) suggests begins with ideas (conjectures) and is followed up by empirical research to disprove or refute them. In the next chapter, Chapter Eleven, an explanation is given on how a research instrument was designed to test the hypothetical *Pedagogical Variation* model.

This chapter outlined the research strategy with respect to undertaking a survey method using an online questionnaire. Snowball sampling was found to be a convenient way of gathering together a sample population without the need to devise a time-consuming random sampling procedure which would have been an ineffective method since e-moderators are dispersed both geographically and in location and time-zones.

This chapter concludes the section on the research methodology. The next section deals with the outcomes of the research investigation. There are three main topics to be considered, namely (i) results from the elicitation process using a methodology based on personal construct psychology (ii) the results from the process of corroboration using content analysis of e-moderator statement made to explain their choice of bi-polar constructs and (iii) the outcomes from the hypothesis testing research instrument used on Models 1, 2 and 3..

In the following chapter, Chapter Eleven, the outcomes of the research investigation are presented with respect to the elicitation of e-moderator perceptions of their online roles and relationships.

PART THREE

Research Findings

Chapter Eleven

Personal Construct Psychology Results
Empirical Study 1

In Chapter Seven, Section 7.7, the implementation of an initial Pilot Study (n=3) was discussed to show how the results were obtained. The small pilot sample gave a good indication that the methodology borrowed from Personal Construct Psychology was fitting for the elicitation of e-moderator perceptions of their online roles and that statements could be obtained for the corroboration of the hypothetical *Pedagogical Variation.* model. The method of elicitation using triads of supplied elements seemed to evoke data which became invaluable for corroborating the hypothetical model, for online teaching and learning in ALNs. This phase of the research study was underpinned by objective two, namely *to elicit e-moderator perceptions of their online roles and relations in asynchronous discussion forums to corroborate the emerging conceptual model* (Chapter Seven, Section 7.0). Two further sample populations were used in the investigation. These outcomes are discussed below.

11.0 Outcomes from 2nd Pilot Sample (n=7)

At this stage of the research, having experienced the process of eliciting personal constructs from the three participants in the pilot sample, face-to-face, the table of triads was examined. It was realised that some triads had not yet been selected for elicitation. The next sample of seven participants all included experienced e-moderators, teaching online for a minimum of three years, who were engaged in the e-delivery of the UoG MA (Professional Development) modules. The same Table 11.1 shows five (non-highlighted) triads that had not yet been accounted for during previous elicitation trials.

Table 11.1: Descriptive labels in the triadic combinations of the above numbered research elements (1-6)

Weaving Archiving Summarising	Archiving Summarising Scaffolding	Archiving Scaffolding Knowledge constructing	Summarising Weaving Scaffolding	Summarising Scaffolding Knowledge constructing	Scaffolding Weaving Knowledge constructing	Knowledge constructing Weaving Socializing
Weaving Archiving Scaffolding	Archiving Summarising Knowledge constructing	Archiving Scaffolding Socializing	Summarising Weaving Knowledge constructing	Summarising Scaffolding Socializing	Scaffolding Weaving Socializing	Knowledge constructing Summarising Socializing
Weaving Archiving Knowledge constructing	Archiving Summarising Socializing	Archiving Knowledge constructing Socializing	Summarising Weaving Socializing			Knowledge constructing Scaffolding Socializing
Weaving Archiving Socializing						

During this 2nd Pilot Sample (n=7) investigation, the five "untrialled" triads were offered first to observe whether further constructs were to emerge that may be either similar or

different from the ones already obtained in the 1st Pilot Sample (n=3). At this point, participants in the 1st Pilot Sample had taken up and completed the University's e-moderator 13-week courses but had not as yet actually taken an active part in undertaking e-moderating.

Due to time constraints, the results are tabulated as an "aggregate" set of constructs rather than individual tabulations for each participant, as for the 1st Pilot Sample. It was recognised that to treat each set of emerging constructs on an individual basis, to be followed up with a personal interview may well reveal interesting issues regarding participant's "tacit" knowledge in their e-moderating experiences, becoming more explicit.

Table 11.2: 2nd Pilot Sample participants' record of bipolar construct elicitation

Selected Triad of Elements	Record Number	2 Elements that are the Same	Elicited bipolar CONSTRUCTS Emergent Pole		Implicit Pole	Element as the odd-one-out
Archiving Summarising Scaffolding	16	**Archiving Summarising**	activity for bringing thread to a close	v.	supporting student ideas -motivational	**Scaffolding**
Archiving Summarising Socializing	17	**Summarising Socializing**	provokes participation	v.	encourages 'lurking'	**Archiving**
Archiving Scaffolding Socializing	18	**Archiving Socializing**	may not be curriculum focused	v.	manoeuvres the debate towards key curriculum issues	**Scaffolding**
Summarising Scaffolding Knowledge constructing	19	**Sc\ffolding Knowledge constructing**	Encourages process 'building up + out'	v.	encourages closure	**Summarising**
Scaffolding Weaving Socializing	20	**Scaffolding Weaving**	Freedom to explore ideas confidently	v.	not restricted to curriculum support	**Socializing**
Knowledge constructing Summarising Socializing	21	**Socializing Knowledge constructing**	Vygotsky-Learning thro' People *Constructivist*	v.	1-way *reflective* on e-learners' input	**Summarising**
Weaving Archiving Scaffolding	22	**Weaving** **Scaffolding**	'pulling ideas together via active threads'	v.	'put away postings too bulky to handle - bring to a close	**Archiving**
Summarising Scaffolding Socializing	23	**Scaffolding Socializing**	Scaffold to step from one idea to another thro' social Dimension 'peer-learning'	v.	'didactic' approach e-moderator directed "telling" e-learners 'what is happening via their interactions'	**Summarising**
Weaving Archiving Knowledge constructing	24	**Weaving Knowledge constructing**	Weaving guides A *dynamic* knowledge Construction	v.	'static' where e-learner recognises end of thread. A management activity for e-moderator	**Archiving**
Weaving Archiving Socializing	25	**Archiving Socializing**	No specific learning activity necessarily occurring.	v.	weaving allows for active sharing specific ideas/concepts on threads.	**Weaving**
Summarising Weaving Knowledge constructing	26	**Summarising Weaving**	Ideas/concepts developed explicitly via postings by e-moderator	v.	e-learner tacit experiential conceptualisation	**Knowledge constructing**

Dretske (1988:116) points out "...knowing-how involves more than just a certain technical or physical "know-how"; it also involves knowing how to obtain desired end-states,

knowing what to do in order to obtain them, and knowing when to do it." Statements, providing reasons for e-moderator choices of elements during the elicitation of bipolar constructs were carefully recorded. These provided a rich source of data which was used to corroborate a Model for online teaching and learning. Table 11.2, above shows further insight to the outcomes of the 2nd Pilot Sample.

11.1 What Study 2nd Pilot Sample reveals

The 2nd Pilot Sample revealed that the five triads as shown in Figure 7.1 (2,5,10,13 and 16) that were not selected in the 1st Pilot Sample (i.e. Table 11.2, items 16-20 inclusive) also, successfully elicited bipolar constructs from respondents in this sample. The outcomes, emerging (records 16-26 inclusive) provided interesting insights to how the bipolar constructs were elicited. To analyse these results those records that showed the same elements that were the "odd-one-out" were grouped together e.g. the element <summarising> had appeared as the "odd-one-out", three times (records 19, 21 and 23). The results of this analytical procedure are shown in the table below.

Table 11.3 The Occurrences of each of the Odd-One-Out Element in the selected Triads

Item No.	"Odd-One-Out" Element	Record No(s).	Attributes elicited as Implicit Pole
1	Scaffolding	16 18	"Supporting Student Ideas, Motivational" "Manoeuvres the debate to key curriculum issues"
2	Archiving	17 22	"...encourages 'lurking'..." "Put away postings too bulky to handle; bring to a close"
3	Summarising	19 21 23	"..encourage closure. .." " a *1-way reflective* on e-learner's input" "Didactic approach, e-moderator directed, telling e-learners what is happening via their interactions"
4	Socialising	20	" Not restricted to curriculum support"
5	Weaving	25	"Weaving allows for active sharing specific ideas/ Concepts on threads
6	Knowledge Construction	26	"e-learner tacit experiential conceptualisation"

From the above tabulation, it was observed that the odd-one-out approach that is focusing on the element that underpinned the attribute of the implicit pole of the bipolar constructs emerging provided insights to how the participant e-moderators reflected on their online roles and relationships with respect to the element in question. It was noticed also how some participants grappled to identify the reasons why "two elements were the same", at the same time giving a reason as to why the third element in the selected triad was different. Statements, providing reasons for e-moderator choices of elements during the elicitation of bipolar constructs were carefully recorded (Appendix D2). These provided a rich source of data which was used to corroborate the three hypothetical models for online teaching and learning (Chapter Eight and Chapter Twelve).

In the fourth column of Table 11.3 above, there emerges a pattern of attributes that identify the nature of the implicit pole, which is not necessarily directly opposite in meaning to that of the explicit pole (i.e. identifying the 'sameness' of two elements selected in the triad). With the above analytical approach in this research investigation, tabulations for the outcomes of another sample, the Final Representative Research Sample (n=17), were made within a similar framework as Table 11.2.

11.2 Outcomes from Final Representative Research Sample (n=17)

This final Representative Research Sample (n=17) was analysed after recording results from the previous two studies, observing that patterns were emerging, through the tabulated results and analyses (Appendix D3). It seemed that some of the participant's choice of poles did not always rely heavily on the similarity or emergent pole but rather the choice was initiated by focusing on singling out the odd-one-out / different i.e. implicit pole. Therefore, the results of the final Representative Research Sample rely on the tabulated results dependent on the element selected as the odd-one-out. The list of six selected elements which e-moderators recognised to be their key competences in their online roles and relationships in asynchronous e-learning discussion boards are listed below, there being no significant relevance in their order in the list.

1. Weaving
2. Archiving
3. Summarising
4. Scaffolding
5. Knowledge Constructing
6. Socializing

The elicitation of the bipolar constructs on a particular element was carried out in a particular place and at a particular time, rather like a photograph – a snapshot of that person's views at that time and place in an attempt to take as accurate a picture as possible. All the participants in the research samples were comfortable, co-operative and confident during both the process of selecting the triads of elements and the construing of the bipolar constructs (emergent and implicit poles). No-one grappled problematically with the elicitation of the bipolar constructs in any one of the triads selected, such that they provided their interpretation of their selections with no difficulty by linking the selected elements to their perceived leadership skills and/or their perceptions of their e-learner online capabilities in collaboration and knowledge construction. In some cases, however it took some time to clarify, in their own minds, the selection(s) that had been made, sometimes on impulse or

gut-feeling. These reasons for selections gave invaluable insight for the corroboration of the *Pedagogical Variation* model (Chapter Eight and Chapter Twelve).

11.2.1 Extracting Records with Element 1 *Weaving* as odd-one-out

The tabulation below, Table 11.4, shows the outcomes when the odd-one-out element was selected as *Weaving* (shown as the first element in the list above in Section 11.2).

Table 11.4 Representative Research Sample participants' constructs with odd-one-out Element =*Weaving*

Record Number	Selected Triad of Elements	2 Elements that are the Same	Elicited bipolar CONSTRUCTS Emergent Pole		Implicit Pole	Element as the odd-one-out
27	Weaving Archiving Summarising	Archiving Summarising	can be a means for closing unproductive thread	v	acting as catalyst to challenge ideas	Weaving
28	Weaving Archiving Scaffolding	Archiving Scaffolding	controlling 'lurking'	v.	energising learning potential for e-learners	Weaving
29	Weaving Archiving Knowledge constructing	Archiving Knowledge constructing	recording purposeful debate in thread	v.	achieving interaction amongst peer group e-learners	Weaving
30	Weaving Archiving Socializing	Archiving Socializing	providing a focus for messaging history	v.	communicating comfortably without visual cues	Weaving
31	Summarising Weaving Scaffolding	Summarising Scaffolding	opportunity to recapitulate ideas confidently	v.	opportunity to pace discussion i.e. time management	Weaving
32	Summarising Weaving Knowledge constructing	Summarising Knowledge constructing	energising online debates confidently	v.	showing positive critical; appraisal of peer-group contributions	Weaving
33	Summarising Weaving Socializing	Summarising Socializing	creative reflection on effective communication	v.	placing emphasis on combined efforts of e-learner debates	Weaving
34	Scaffolding Weaving Knowledge constructing	Scaffolding Knowledge constructing	triggering discussions by posing intriguing questions	v.	valuing e-learner inputs by creating. a tapestry of ides	Weaving
35	Scaffolding Weaving Socializing	Scaffolding Socializing	adopting new teaching. approaches without visual cues	v.	enlivening postings by recombining subject-based ideas	Weaving
36	Knowledge constructing Weaving Socializing	Knowledge constructing Socializing	building online 'trust' in exploring ideas together confidently	v	selecting and sorting e-learner contributions into a thought-provoking framework	Weaving

11.2.2 Extracting Records with Element 2 *Archiving* as odd-one-out

The tabulation, Table 11.5, shows the outcomes when the odd-one-out element was selected as *Archiving* (shown as the second element in the list above in Section 11.2). The recordings of the implicit poles formulate a clear description of the element *Archiving*. The statements explaining why the other two elements were the same and why *Archiving* was different to them were invaluable in the process of corroboration of the three hypothetical models (Chapter Eight and Chapter Twelve).

Table 11.5 Representative Research Sample participants' constructs with odd-one-out Element = *Archiving*

Record Number	Selected Triad of Elements	2 Elements that are the Same	Elicited bipolar CONSTRUCTS Emergent Pole		Implicit Pole	Element as the odd-one-out
37	Weaving Archiving Summarising	**Weaving** **Summarising**	active engagement to foster online understandings	v.	supporting student ideas by making a permanent record	**Archiving**
38	Weaving Archiving Scaffolding	**Weaving** **Scaffolding**	Attempting to prevent 'lurking', encouraging everyone to post ideas	v.	easy for 'lurkers' to identify important ideas/threads	**Archiving**
39	Archiving Scaffolding Socializing	**Scaffolding** **Socializing**	creating links to subject-matter by social construction	v.	manoeuvres the debate towards key curriculum issues	**Archiving**
40	Weaving Archiving Knowledge constructing	**Weaving** **Knowledge constructing**	encouraging process of inter-relating ideas, lateral thinking with subject-matter	v.	controlling what becomes a permanent record of inter-activity	**Archiving**
41	Archiving Summarising Knowledge constructing	**Summarising** **Knowledge constructing**	freedom to explore new ways of dealing with complex issues/problems	v.	restricted to curriculum support by accuracy of recording outcomes	**Archiving**
42	Archiving Summarising Socializing	**Summarising** **Socializing**	creating confidence through personal 'feedback' in summary	v.	knowing when to close unproductive threads	**Archiving**
43	Archiving Scaffolding Knowledge constructing	**Scaffolding** **Knowledge constructing**	establishing an online identity as the e-moderator and facilitator	v.	Knowing when a thread has been 'exhausted' by the e-learning peers	**Archiving**
44	Archiving Scaffolding Summarising	**Scaffolding** **Summarising**	active online e-moderator contributions to facilitate conceptual learning process	v.	no interactivity with e-learners because e-moderator "packs" thread away for revisiting	**Archiving**
45	Archiving Knowledge constructing Socializing	**Knowledge constructing** **Socializing**	Peer-group interactivity for constructivist development & exchange of ideas/ group discoveries	v.	e-moderator controlling how to "close" debate by close monitoring	**Archiving**
46	Weaving Archiving Socializing	**Weaving** **Socializing**	Peer-group support focused on motivating peer-group interdependence	v.	content/subject centred for recall at a later stage	**Archiving**

11.2.3 Extracting Records with Element 3 *Summarising* as odd-one-out

The tabulation, Table 11.6, shows the outcomes when the odd-one-out element was selected as *Summarising* (shown as the third element in the list above, Section 11.2). The recordings of the implicit poles formulate a clear description of the element *Summarising*.

The statements explaining why the other two elements were the same and why *Summarising* was different to them were invaluable in the process of corroboration of the three hypothetical models (Chapter Eight and Chapter Twelve).

Table 11.6 Representative Research Sample participants' constructs with odd-one-out Element = *Summarising*

Record Number	Selected Triad of Elements	2 Elements that are the Same	Elicited bipolar CONSTRUCTS Emergent Pole	Implicit Pole	Element as the odd-one-out
47	Archiving Summarising Scaffolding	**Archiving** **Scaffolding**	activity for bringing thread to a close	v. supporting student ideas -motivational	**Summarising**
48	Knowledge constructing Summarising Socializing	**Knowledge constructing** **Socializing**	provokes participation amongst e-peers to collaborate online	v. encourages 'lurking' because the "lurker" has an easy synopsis without being "active"	**Summarising**
49	Archiving Summarising Knowledge constructing	**Archiving** **Knowledge constructing**	Know-how to develop intriguing questions that enlighten critical thinking for *model answers*	v Ability to write concisely and accurately about e-learner postings	**Summarising**
50	Archiving Summarising Socializing	**Archiving** **Socializing**	Enlivening peer-group discussions by selecting ideas for later retrieval	v essential to bring about sharing experiences	**Summarising**
51	Weaving Archiving Summarising	Weaving Archiving	Exploring ideas from all participants to create new *tapestry*	v. highlighting significant experiences	Summarising
52	Summarising Weaving Scaffolding	**Weaving** **Scaffolding**	Active intervention highlighting key points from all participants with significant clues to support ideas	v. non-intervention since e-learner points of view are concisely recorded for review	**Summarising**
53	Summarising Weaving Knowledge constructing	**Weaving** **Knowledge constructing**	Pertinent questions and thought-provoking activities to underpin conceptualization of topics	v. significant skill needed to collect all e-learner contributions	**Summarising**
54	Summarising Weaving Socializing	**Weaving** **Socializing**	Actively engaging e-learners on tasks with interpersonal skill	v. a way of keeping a factual record that values all e-learners	**Summarising**
55	Summarising Scaffolding Knowledge constructing	**Scaffolding** **Knowledge constructing**	Triggering debates Energizing online Knowledge-sharing Amongst peer-learners	v. passive yet necessary e-moderator activity for purposeful access to closure	**Summarising**
56	Summarising Scaffolding Socializing	**Scaffolding** **Socializing**	Showing sensitivity to Online relationships In building confidence	v. exhibiting a positive attitude / enthusiasm to record experiences	**Summarising**

11.2.4 Extracting Records with Element 4 *Scaffolding* as odd-one-out

The ten records in the table indicate that there was no difficulty in selecting *Scaffolding* as the odd-one-out. The statements explaining why the other two elements were the same and why *Scaffolding* was different to them were invaluable in the process of corroboration of the three hypothetical models (Chapter Eight and Chapter Twelve).

The tabulation, Table 11.7, shows the outcomes when the odd-one-out element is *Scaffolding*.

Table 11.7. Representative Research Sample participants' constructs with odd-one-out Element = *Scaffolding*

Record Number	Selected Triad of Elements	2 Elements that are the Same	Elicited bipolar CONSTRUCTS Emergent Pole		Implicit Pole	Element as the odd-one-out
57	Weaving Archiving Scaffolding	**Weaving** **Archiving**	Bringing together e-learner contributions to deposit for later retrieval	v.	tutor explanations motivating increased level of e-learner participation	**Scaffolding**
58	Archiving Summarising Scaffolding	**Archiving** **Summarising**	Tutor-based Reporting to collect e-learner responses	v.	discourages 'lurking' by using rhetorical questions to elicit collaborative learning	**Scaffolding**
59	Archiving Scaffolding Knowledge constructing	**Archiving** **Knowledge constructing**	e-learner becomes less active as spectator and observer of tutor inputs/ outputs	v	active e-learner responses to tutor suggestions & explanations	**Scaffolding**
60	Archiving Scaffolding Socializing	**Archiving** **Socializing**	Allows for e-learner "social banter" Because all learning Materials stored anyway	v.	too much e-tutor intervention may stifle e-learner collaboration	**Scaffolding**
61	Summarising Weaving Scaffolding	**Summarising** **Weaving**	e-tutor centred activity to elicit key points /issues recognising inputs	v.	e-learner expectation of e-tutor intervention to guide e-learner insights	**Scaffolding**
62	Summarising Scaffolding Knowledge constructing	**Summarising** **Knowledge constructing**	e-tutor focus to provide knowledge bank to highlight contributions	v.	e-learner support encouraging elaboration of ideas	**Scaffolding**
63	Summarising Scaffolding Socializing	**Summarising** **Socializing**	Emergence of social Construction of 'reality'	v.	discussion to foster diversification of collaborative 'thinking'	**Scaffolding**
64 **6** .	Scaffolding Weaving Knowledge constructing	**Weaving** **Knowledge constructing**	e-learners can reflect on peer-group inputs developing *new ways* of creative understanding	v.	e-tutor shares ideas with e-learners to provoke stimulating rapport with each other	**Scaffolding**
65	Scaffolding Weaving Socializing	**Weaving** **Socializing**	e-learner contributions are interwoven into a collaborative Tapestry	v.	sharing e-tutor expertise with e-learners	**Scaffolding**
66	Knowledge constructing Scaffolding Socializing	**Knowledge constructing** **Socializing**	Peer-group interactions Using imaginative Inter-connectivity Motivating collaboration	v.	e-tutor interaction with specific goal-oriented outcomes in curricula terms.	**Scaffolding**

11.2.5 Extracting Records with Element 5 *Knowledge Construction* as odd-one-out

The tabulation, Table 11.8, shows the outcomes when the odd-one-out element is *Knowledge Construction*. The statements explaining why the other two elements were the

same and why *Knowledge Construction* was different to them were invaluable in the process of corroboration of the three hypothetical models (Chapter Eight and Chapter Twelve).

Table 11.8. Representative Research Sample participants' constructs with odd-one-out Element = *Knowledge Construction*

Record Number	Selected Triad of Elements	2 Elements that are the Same	Elicited bipolar CONSTRUCTS Emergent Pole		Implicit Pole	Element as the odd-one-out
67	Archiving Summarising Knowledge constructing	**Archiving** **Summarising**	e-tutor focus for bringing thread to a close	v.	peer-group interaction with e-tutor to collaborate in e-learning environment	**Knowledge constructing**
68	Archiving Scaffolding Knowledge constructing	**Archiving** **Scaffolding**	Passive e-learner role encourages 'lurking'	v.	active exchange of ideas between e-Tutor & e-learners	**Knowledge constructing**
69	Archiving Knowledge constructing Socializing	**Archiving** **Socializing**	Social construction of reality	v	providing a framework for debate towards key curriculum issues	**Knowledge constructing**
70	Summarising Weaving Knowledge constructing	**Summarising** **Weaving**	e-tutor centered activity with focus on e-learner inputs	v.	assimilation of learning content	**Knowledge constructing**
71	Summarising Scaffolding Knowledge constructing	**Summarising** **Scaffolding**	Exploration of ideas to elicit e-learner understandings	v	curriculum centred for debating key issues	**Knowledge constructing**
72	Scaffolding Weaving Knowledge constructing	**Scaffolding** **Weaving**	e-tutor centered reflectingpeer-group cohesion	v.	e-learner participation with e-tutor guidance	**Knowledge constructing**
73	Knowledge constructing Weaving Socializing	**Weaving** **Socializing**	A less formal way of Learning by incidental Tacit knowledge	v.	more structured formal way of learning with specific goals	**Knowledge constructing**
74	Knowledge constructing Summarising Socializing	Summarising Socializing	e-peers rely on e-tutor to reflect on peer group ideas / insights	v.	creation of knowledge through peer-group interpretation	Knowledge constructing
75	Knowledge constructing Scaffolding Socializing	**Scaffolding** **Socializing**	Less able e-learners Depend on e-tutor Support	v.	more highly motivated e-learners create ideas to build on previous e-learning experiences.	**Knowledge constructing**
76	Weaving Archiving Knowledge constructing	**Weaving** **Archiving**	e-tutor enrichment of collaborative inputs	v.	e-learner becomes more confident and independent of 'others'	**Knowledge constructing**

11.2.6 Extracting Records with Element 6 *Socializing* as odd-one-out

The tabulation, over page shows how research participants differentiated between three elements in a self-selected triad, where the odd-one-out resulted as the element *Socialising*. The reasons provided in the statements for their bipolar selections gave valuable insights for the design of the *Pedagogical Variation* model for online teaching and learning (Chapter Eight and, Chapter Twelve).

Table 11.9 Representative Research Sample participants' constructs with odd-one-out Element = *Socialising*

Record Number	Selected Triad of Elements	2 Elements that are the Same	Elicited bipolar CONSTRUCTS Emergent Pole		Implicit Pole	Element as the odd-one-out
77	Weaving Archiving Socializing	**Weaving Archiving**	activity for bringing thread to a close	v.	supporting student ideas -motivational	**Socializing**
78	Archiving Summarising Socializing	**Archiving Summarising**	provokes participation	v.	encourages 'lurking'	**Socializing**
79	Archiving Scaffolding Socializing	**Archiving Scaffolding**	may not be curriculum focused	v.	manoeuvres the debate towards key curriculum issues	**Socializing**
80	Archiving Knowledge constructing Socializing	**Archiving Knowledge constructing**	Encourages process 'building up + out'	v.	encourages closure	**Socializing**
81	Scaffolding Weaving Socializing	**Scaffolding Weaving**	Freedom to explore ideas confidently with e-moderator guidance	v.	not restricted to curriculum support	**Socializing**
82	Summarising Weaving Socializing	**Summarising Weaving**	e-moderator Analysis Individual meanings from e-learners contributions	v.	e-peer group collaborative reasoning	**Socializing**
83	Summarising Scaffolding Socializing	**Summarising Scaffolding**	e-moderator process to support / maintain ongoing effective learning	v.	e-peer motivation encouraging each other to "hang-in"	**Socializing**
84	Knowledge constructing Scaffolding Socializing	**Knowledge constructing Scaffolding**	e-moderator tasks to elucidate / clarify difficult concepts	v.	e-peer encouragement to make progress in conceptualization	**Socializing**
85	Knowledge constructing Weaving Socializing	**Knowledge constructing Weaving**	e-moderator tasks to elucidate / clarify difficult concepts	v.	e-peer encouragement to make progress in conceptualization	**Socializing**
86	Knowledge constructing Summarising Socializing	Knowledge constructing Summarising	E-moderator efforts to pre-determine/establish learning objectives	v.	e-peer joint efforts to complete tasks together	Socializing

The recordings of the implicit poles formulate not only a clear description of the element-*Socializing* but also to some extent an explanation of the practical usefulness of *Socializing* during e-moderating online in asynchronous discussion boards.

11.3 What the Representative Research Sample reveals

The findings from the Representative Research Sample, tabulated in Tables 11.4 to 11.9 when summarised as a narrative for each of the six odd-one-out elements (i)weaving, Table 11.4 (ii) archiving Table 11.5 (iii) summarising Table 11.6 (iv) scaffolding Table 11.7 (v) knowledge construction Table 11.8 and (vi) socializing Table 11.9 reveal e-moderator perceptions about these six online e-moderating competencies, in relation to their e-learning groups. These are discussed below.

11.3.1 Weaving Table 11.4

Themes, relating to the process of weaving that emerge at the implicit pole are observed to be motivational where weaving is seen to act as a 'catalyst' to challenge e-learner ideas. At the same time this activity appears to be seen as 'energising' e-learners to achieve 'interaction' within the e-peer group. Weaving also appears to communicate 'comfortably without visual cues providing the opportunity to pace discussions where e-moderators, through weaving may introduce positive feedback and 'critical appraisal' without causing anger amongst the e-learners. At the same time it is noted from these research participants' responses, that weaving places an emphasis on the 'combined efforts of the e-learners in forum debates, where e-learner inputs are valued by online tutors who are able to pull the threads together to 'weave tapestry of rich collaborative ideas' from the e-peer group, while at the same time providing further 'thought-provoking' ideas.

11.3.2 Archiving Table 11.5

Themes, relating to the process of archiving that emerge at the implicit pole are observed to be supportive where archiving is seen to act as a 'permanent record' to of e-learner interaction. At the same time this activity appears to be seen as 'attracting lurkers' to identify important 'ideas' emerging within the e-peer group. Archiving also appears to be restricting e-learners to 'curriculum support' giving for some e-learners limitations to their contributions for 'fear of looking silly'. The process of archiving is also perceived to give e-moderators the opportunity to close unproductive threads giving e-learners the signal when a thread has been 'exhausted'. The archiving activity is seen to be e-moderator focused without interactivity from the e-learners, where the e-moderators perceive this activity to give them control to 'close' an online debate where they may 'pack away a thread to be re-visited' at a later stage by the e-learning community for recall whenever necessary.

11.3.3 Summarising Table 11.6

Themes, relating to the process of summarising that emerge at the implicit pole are observed to be supporting e-learner ideas and therefore motivational. This activity, as compared with archiving, also appears to e-moderators to attract 'lurkers' who have the opportunity to identify with what has been happening during the online debates, without contributing themselves. Summarising is seen by the research participants to act as a means to 'highlight' significant experiences occurring during the online debates where 'sharing of ideas' becomes paramount. Whilst the e-moderators perceive this activity to be e-moderator-centred, the nature of non-intervention during this process offers e-moderators the

opportunity to develop their skill in collecting e-learner contributions together. In this way e-moderators express their willingness to keep a 'factual record' that enthusiastically values all e-learners. For the e-learners this is perceived by the e-moderators to be a passive activity but at the same time this activity appears to be an important and 'purposeful' one to achieve 'closure' of a thread when it becomes 'exhausted'.

11.3.4 Scaffolding

Table 11.7

Themes, relating to the process of scaffolding which emerge at the implicit pole are observed to be motivational, 'increasing the levels of e-learner participation'. In contrast to the activities of archiving and summarising, scaffolding is perceived to discourage 'lurking' by using 'rhetorical questions to elicit collaborative learning where e-learner responses to tutor suggestions and explanations are encouraged. Scaffolding is seen to act as a 'framework' to elaborate e-learner ideas, while at the same time this activity appears to be seen as 'fostering diversification within collaborative thinking' amongst e-learners. The research respondents perceive that this online activity encourages e-tutors to share their expertise interacting with their e-learners with specific goal-oriented outcomes focusing on curricula terms.

11.3.5 Knowledge Construction

Table 11.8

Themes, relating to the process of knowledge construction which emerge at the implicit pole are observed to 'encourage collaborative exchange of ideas between e-learners and e-moderators' creating a framework for 'debate towards key curriculum issues'. The research participants reflected that this activity of knowledge construction also brings about 'the assimilation of learning content where e-learners are enabled to participate 'with e-tutor guidance'. At the same time this activity appears to be seen as providing a framework for a 'more structured formal way of learning (online) with specific goal-setting parameters' which lends itself to the 'creation of knowledge through peer-group interpretation(s)'. E-moderator responses indicate that this activity of knowledge construction also allows 'more highly motivated e-learners to create ideas to build on previous e-learning experiences. A final observation was made that illuminates how an 'e-learner may become more confident and independent of others' to achieve specific learning goals.

11.3.6 Socializing

Table 11.9

Themes, relating to the process of socializing that emerge at the implicit pole are observed to be 'motivational' in supporting student ideas but at the same time may be perceived by e-

moderators to encourage 'lurking'. Socialization may at times also appear, to e-moderators to lead to 'closure' where interactions may take place at a trivial level, without being restricted to curriculum key issues. Socialization is seen to act as an activity allowing 'collaborative reasoning' for e-learner ideas to emerge. At the same time this activity appears to be seen as giving e-learners the opportunity to support one another by encouraging each other to 'hang-in' when times are difficult. Socializing is also perceived as a means whereby e-learners enjoy their e-peer group encouragement to make 'progress in conceptualizing ideas together so that e-peer joint efforts to complete tasks together' becomes a central feature in their online learning environment.

The next section, Section 11.4, discusses how e-moderators gave reasons for their selection of elements as the two which were identified as similar and the third as different. These reasons collected as statements were invaluable in the corroboration of a conceptual framework for online learning and teaching (Chapter Eight and Chapter Twelve).

11.4 Collecting e-moderator statements giving reasons for selection of bipolar constructs

During the elicitation process of bipolar constructs, the outcomes of e-moderator selections were recorded as shown by the tabulations in this chapter i.e. Tables 11.4 to 11.9, in particular. The reasons for their selections were recorded as statements. Each statement provided a reason as to why the research participant selected two elements that were perceived to be more like each other than the third which was perceived to be different.

Figure 11.1 Data Record for 2 bipolar statements

Record Number	Selected Triad of Elements	2 Elements that are the Same	Elicited bipolar CONSTRUCTS Emergent Pole		Implicit Pole	Element as the odd-one-out
16	Archiving Summarising Scaffolding	**Archiving** **Summarising**	Activity for bringing thread to a close	v.	supporting student ideas -motivational	**Scaffolding**

Record No.	eM	Emergent Pole Statement	Implicit Pole Statement
16	07	*"Before I decide to close a thread I will have given my cohort lots of tasks to do online"*	*"I do a lot of scaffolding to keep everyone well motivated to encourage new ideas"*

Statements revealed a participant's perception of their online role with respect to what they perceive they do online as well as how they perceive the way in which their e-learners behave. In some instances these statements reveal the nature of the online learning

environment i.e. asynchronicity which allows both e-moderators and e-learners to reflect on their postings before making the postings visible to the members of the discussion forum. In other statements e-moderators reveal the notion of invisible members (i.e. lurkers) and how they make efforts to encourage their online participation. Some statements identify the importance of recognising which e-learners are confident, or not, in collaborating with e-peers and able, or not, to develop new ideas together. Figure 11.1 illustrates how e-moderator statements were recorded.

The first three participants in the initial pilot sample gave fragments in their statements that provided the research with the quadrants in Model 1 (A, B, C, and D) and Model 2 (E, F, G, and H.) But there were no data to emerging for the quadrants in Model 3 (AE, BF, CD and GH). The Research Instrument, The Participant Information Sheet, Figure 7.1, then was reworded to indicate that participants could use both sets of variable *together* (rather than the previous samples using *separate* pairs) (Appendix D) i.e. Task-giving and motivational skills together with their perceptions of e-learner collaborative and knowledge construction abilities/preferences in online discussion forums.
From the 17 research participants, in the final sample (n=17), a total of 196 Data Statement Records were obtained each with a pair of bipolar constructs. These records formed the basis for content analysis in the corroboration of the conceptual models for online teaching and learning as discussed in Chapter Twelve

11.5 Summary

This chapter discussed how the research methodology based on ideas from Personal Construct Psychology was implemented. The collection of data from the 2nd Pilot Sample (n=7), found in Appendix D2 and the Representative Research Sample (n=17), found in Appendix D3, was used to show how the corroboration of Model 1, Model 2 and Model 3 for *Pedagogical Variation* for online teaching and learning was carried out.

In the next chapter, Chapter Twelve, the results of the content analysis implemented in the corroboration of the three models, Model 1, Model 2, and Model 3, with data from the Representative Research Sample (n=17) are discussed.

Chapter Twelve

Corroborating the Hypothetical Models

12.0 Introduction: Outcomes from Coding Templates

This chapter discusses how the analysis of the data from the investigation borrowing ideas from Personal Construct Psychology revealed interesting outcomes with respect to the hypothetic-deductive process of coding the data as far as possible and matching the results to the conceptualised pedagogical models i.e. Matrix Model 1, Matrix Model 2 and Matrix Model 3, as discussed in the previous chapter, Chapter Eleven..

The process of coding was not straight forward, but rather more complicated. Whilst the coding templates gave definitive descriptive identifiers with respect to the four constructs (F1, F2, F3 and F4) contributing to Matrix Model 1 and the four contributing constructs (F5,F6,F7 and F8) to Matrix Model 2, as shown in the Table 12.1 below, several of the statement had somewhat fuzzy connotations. These are discussed further in sections following. These raised problematic issues because hard line decisions had to be made as to whether to include or exclude them from the matching process. Those that were excluded were seen as indeterminable.

Table 12.1 Coding Identifiers for the constructs in Model 1 and Model 2

Matrix Model 1 Contributing Factors				**Matrix Model 2 Contributing Factors**		
Factor-ID	Description	Code		Factor-ID	Description	Code
F1	Low-Task Giving	1		F5	High Collaborative Capability	5
F2	High-Task Giving	2		F6	Low Collaborative Capability	6
F3	Low-Motivational Support	3		F7	High Knowledge Construction Ability	7
F4	High-Motivational Support	4		F8	Low Knowledge Construction Ability	8

After reading and re-reading the data, it was realised that it would be a time-consuming process, if at all possible, to make fair judgements with respect to the decision-making process of selecting relevant codes for the various fragments of data which were embedded in the statements.

Section 12.2 discusses the emergence of data from the 2nd Pilot Sample (n=7) and the final Representative Research Sample (n=17). It was necessary to find a way to present an analysis of the data with respect to the coding outcomes and the matching process of the coded fragments with each of the three pedagogical conceptualisations (i.e. Matrix Model 1, Matrix Model 2 and Matrix Model 3) in the best possible format. A decision was made to present the outcomes in three sections as follows. Section 12.2 illustrates and explains the way in which emerging coded fragments matched, in one way or another with one of the four contributing constructs (F1, F2, F3 and F4) designated in Matrix Model 1. Similarly, Section 12.3 illustrates and explains the way in which emerging coded fragments matched, in one way or another with one of the four contributing constructs (F5, F6, F7 and F8) designated in Matrix Model 2.

Finally, Section 12.4 illustrates and explains the way in which coded fragments matched, again in one way or another, in identifiable combinations of four constructs which together matched those in a quadrant in the emerging Matrix Model 3 for *Pedagogical Variation.* In conclusion, the significance of the outcomes in the current research is discussed more fully in the next chapter, Chapter Thirteen to pave the way forward for further empirical research.

12.1 The Data

In the empirical investigation carried using three sample populations, namely, an initial, 1st Pilot Sample (n=3 participants), 2nd Pilot Sample (n=7 participants) and the Representative Research Sample (n=17 participants), a rich tapestry of data was collected (Appendices D1, D2, and D3) as described in the previous chapter. Diagram11.1 illustrated how the research participants' statements, two per record, accumulated from each individual record. The two statements in each of the records collected were to provide the data for this stage of the research.

Table 12.2 Data collection from the first empirical investigation

Item	Research Samples	No. of Participants	No. of Records	No .of Statements
1	1st Pilot	3	15	30
2	2nd Pilot	7	11	22
3	Representative Research Sample	17	170	240
Total	3 Samples	27	196	**392**

During a close preliminary inspection of the interview data (Appendices D1, D2, and D3) which were transcribed from tape recordings together with written notes at the time of eliciting the bipolar constructs, it was realised that it was going to be an overwhelming task to start the coding process with the 392 statements.

12.2 Corroborative Evidence for Hypothetical Matrix Model 1

Firstly, as a means of corroboration for the hypothetical Model 1, statements which contained fragments that matched with a criterion for task-giving and a criterion for motivational support were searched for.

Coding Template 1 (Appendix B4) was used to identify (i)) the criteria for two task-giving constructs (1=low (F1), 2=high (F2)) and Coding Template 2 (Appendix B4) was used to identify (ii) the criteria for two motivational support constructs (3=low (F3), 4=high (F4)) simultaneously. When a statement contained only two coded fragments showing a combination of one construct from Coding Template 1 with one construct from Coding Template 2, and no other constructs, then this provided an instance where the resulting constructs could be matched with those in one of the four quadrants in Model 1. Here are four examples of the process.

(i) Example 1 Statement contains only two coded fragments where fragment (i) =Code-1=F1 and fragment (ii) =Code-3=F3.This matches the two constructs in Quadrant A. Table 12.3 shows an example of such an outcome.

Table 12.3 Example of an A-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
1	117	20	*"There are occasions when I provide minimal tasks, with little intervention"*	*'provide minimal tasks'*	1	A
				'with little intervention'	3	

ii) Example 2 Statement contains only two coded fragments where fragment (i) =Code-2=F2 and fragment (ii) =Code-2=F3.This matches the two constructs in Quadrant B.

Table 12.4 Example of a B-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
2	99	18	*There are occasions when I am flexible, giving lots of tasks, and not so much friendly coaxing when e-learners are busy'*	*'giving lots of tasks'*	2	B
				'not so much friendly coaxing'	3	

(iii) Example 3 Statement contains only two coded fragments where fragment (i) =Code-2=F2 and fragment (ii) =Code-4=F4.This matches the two constructs in Quadrant C.

Table 12.5 Example of a C-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
3	68	17	*"I give a good number of tasks as well as providing as much motivation as I can"*	*'A good number of tasks'*	2	C
				'As much motivation as I can'	4	

(iv) Example 4 Statement contains only two coded fragments fragment (i) =Code-1=F1 and fragment (ii) =Code-4=F4.This matches the two constructs in Quadrant D.

Table 12.6 Example of a D-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
4	129	21	*"e-learners get a lot of coaxing from me but not so many tasks"*	*'Not so many tasks'*	1	D
				'a lot of coaxing from me'	4	

12.3 Corroborative Evidence for Hypothetical Matrix Model 2

As a means of corroboration for the hypothetical Matrix Model 2, statements which contained fragments that matched with a criterion for collaborative capability and a criterion for knowledge construction ability were searched for.

Coding Template 3 (Appendix B5(i)), identifies the criteria for two collaborative capability constructs (5=high(F5), 6=low(F6)) and Coding Template 4 (Appendix B5(ii)), identifies the criteria for two knowledge construction ability constructs (7=high(F7), 8=low(F8)) simultaneously. When a statement contained only two coded fragments showing a combination of one construct from Coding Template 3 with one construct from Coding Template 4, and no other constructs, then this provided an instance where the resulting constructs could be matched with those in one of the four quadrants in Model 2.

Here are examples of this process.

(v) Example 1 Statement contains only two coded fragments where fragment (i) =Code-5=F5 and fragment (ii) =Code-7=F7.This matches the two constructs in Quadrant E (above)

Table 12.7 Example of an E-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
5	175	25	*"In the cohort my students generate many new ideas through a lot of collaboration online"*	*'A lot of collaboration online'*	5	E
				'Generate many new ideas'	7	

(vi) Example 2 Statement contains only two coded fragments where fragment (i) =Code-6=F6 and fragment (ii) =Code-7=F7.This matches the two constructs in Quadrant F.

Table 12.8 Example of a F-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
6	91	17	*"My students can construct knowledge well online but they are more independent and don't share their ideas with each other"*	*'Independent and don't share their ideas with each other'*	6	F
				'Students can construct knowledge well online'	7	

(vii) Example 3 Statement contains only two coded fragments where fragment (i) =Code-6=F6 and fragment (ii) =Code-8=F8.This matches the two constructs in Quadrant G.

Table 12.9 Example of a G-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
7	162	24	*"I have great difficulty to get students online"*	(implies absence of collaboration online)	6	G
				(Implies absence of knowledge construction online)	8	

(viii) Example 4 Statement contains only two coded fragments where fragment (i) =Code-5=F5 and fragment (ii) =Code-8=F8.This matches the two constructs in Quadrant H.

Table 12.10 Example of an H-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
8	59	14	*"whilst the is a lot of socialising and collaborating, there is little knowledge construction"*	*'a lot of socialising and collaborating',*	5	H
				'little knowledge construction'	8	

The above four items, (v) to (viii) inclusive indicate how I managed to find examples of e-moderator statements containing coded fragments which fell neatly into the four categories, E,F,G and H respectively in my hypothetical matrix model-2. This is not to say that there were several statements which contained neutral fragments (i.e. those where qualifiers such 'as a lot' or 'a little' were absent to indicate the degree of collaborative capability or knowledge construction ability. In Section 14.4 a summary is given of the statistical outcomes associated with the degree of corroboration obtained.

12.4 Corroborative Evidence for Hypothetical Matrix Model 3 for *Pedagogical Variation* for online learning and teaching

The next stage was the identification of statements which contained fragments that matched with a criterion for transactional behaviour, transformational behaviour, collaborative capability and a criterion for knowledge construction ability, as a means of corroboration for the hypothetical Matrix Model 3.

All four coding templates (Appendices B4 and B5) were implemented as in the previous two content analyses for matching fragments of statements with one of the categories in Matrix Model1 (i.e. A, B, C or D) and with one of the categories in Matrix Model 2 (i.e. E, F, G or H) When a statement contained four coded fragments showing a combination of one construct from Coding Template 1,one construct from Coding Template 2, one construct from Coding Template 3 and one construct from Coding Template 4 and no other constructs, then this provided an instance where the resulting constructs could be matched with those in one of the four quadrants in Model 3.

Here are examples of this process.

(ix) Example 1 Statement contains four coded fragments where fragment (i) =Code-1=F1 and fragment (ii) =Code-3=F3. (iii) =Code-5=F5 and fragment (iv) =Code-7=F7.This matches the four constructs in Quadrant AE.

Table 12.11 Example of an AE-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
9	112	19	*"I keep tasks to a minimum when I notice e-peers are keen to collaborate with each other. At the same time there is less need to motivate them as they are busy constructing knowledge a lot"*	*'keep tasks to a minimum'*	1	AE
				'less need to motivate them'	3	
				'keen to collaborate with each other'	5	
				'busy constructing knowledge a lot'	7	

It was really time-consuming to code all the examples which fitted into the respective categories of hypothetical Matrix Model 3, because four constructs had to be matched in comparison to two matches for each of the categories in Models 1 and 2.

(x) Example 2 Statement contains four coded fragments where fragment (i) =Code-2=F2 and fragment (ii) =Code-3=F3. (iii) =Code-6=F6 and fragment (iv) =Code-8=F8.This matches the four constructs in Quadrant BF.

Table 12.12 Example of a BF-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
10	147	23	*'I know that many e-learners in my cohort are self-motivated so I do not have to give them so much motivation. I They like to be kept busy with lots of tasks. They are very good at knowledge construction, generating their own ideas but they are unable to collaborate or share their ideas with each other*	*.'to keep them busy with lots of tasks*	2	BF
				'I do not have to give them so much motivation.'	3	
				'unable to collaborate or share their ideas with each other'	6	
				'very good at knowledge construction, generating their own ideas '	7	

(xi) Example 3 Statement contains four coded fragments where fragment (i) =Code-2=F2 and fragment (ii) =Code-4=F4. (iii) =Code-6=F6 and Fragment (iv) =Code-8=F8.This matches the four constructs in Quadrant CG.

Table 12.13 Example of a CG-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
11	141	22	*"I find it really hard to bring lurkers online. I send personal emails to give my utmost motivational support. I do a lot of detailed archiving for access to lots of tasks. For some reason they do not participate/collaborate or show me any signs of knowledge construction"*	*' a lot of detailed archiving for access to lots of tasks.'*	2	CG
				' I send personal emails to give my utmost motivational support'	4	
				'they do not participate/collaborate'	6	
				' do not ... show me any signs of knowledge construction'	8	

(xii) fragment (i) =Code-1=F1 and fragment (ii) =Code-4=F4. (iii) =Code-5=F5 and fragment (iv) =Code-8=F8.This matches the four constructs in Quadrant DH

Table 12.14 Example of a DH-only outcome

Item	Record	eM	Statement	Extracted Fragment	Code	Cat.
12	195	27	*"My e-learners enjoy socialising and collaborate a lot but they do not seem to be able to construct knowledge to any great extent. There lies a difficulty. I keep tasks to a minimum with a lot of motivation."*	*'keep tasks to a minimum'*	1	DH
				' with a lot of motivation.'	4	
				'enjoy socialising and collaborate a lot'	5	
				'they do not seem to be able to construct knowledge to any great extent.'	8	

All in all 99 statements were found which matched one of the four categories AE, BF, CG and DH. The above four items, (ix) to (xii) inclusive indicate how I managed to find examples of e-moderator statements containing coded fragments which fell neatly into these four categories. This is not to say that there were several statements which contained neutral fragments (i.e. those where qualifiers such 'as a lot' or 'a little' were absent to indicate the degree of transactional behaviour, transformational behaviour, collaborative capability or knowledge construction ability. In Sections 12.5 and 12.6 below I give a summary of the statistical outcomes associated with the degree of corroboration obtained for Model 1 and Model 2 respectively.

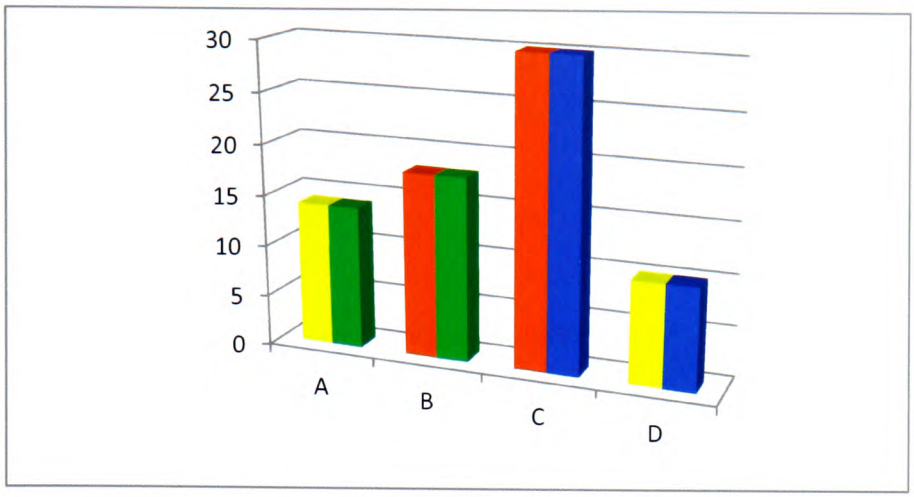
12.5 Statistical Outcomes for Corroborative Evidence for Matrix Model 1 e-Moderator perceptions of what they do online.

Figure 12.1 below indicates the number of statements in a total of statements (n=72) which fell into categories A, B, C, and D. A graphical representation of these outcomes is shown in Bar Chart 12.1

Figure 12.1 The number of statements in each of the 4 Categories (A, B, C, D) and the distribution of their associated constructs (F1, F2, F3 and F4) in Matrix Model 1

Model 1	A	B	C	D	
	F1 14	F2 18	F2 30	F1 10	72
	F3 14	F3 18	F4 30	F4 10	72
					72
	14	18	30	10	Statements

Graph 12.1 Bar Chart Distribution of constructs as corroborative evidence for Hypothetical Matrix Model 1 based on e-moderator perceptions of what they do online



KEY: Colour Codes to above Bar Chart 12.1

Vertical y-axis	=Frequency of e-moderator statements	Construct
	Low Transactional Construct	F1
	High Transactional Construct	F2
	Low Transformational Construct	F3
	High Transformational Construct	F4

The bars in Graph 12.1 Bar Chart show the combination and distribution of transactional and transformational constructs in each of the quadrants A, B, C, and D, as shown in the list below:

For Quadrant A , 14 statements had the combination of constructs F1 and F3
For Quadrant B , 18 statements had the combination of constructs F2 and F3
For Quadrant C , 30 statements had the combination of constructs F2 and F4
For Quadrant D , 10 statements had the combination of constructs F1 and F4

In the next section I present, in a similar way, the statistical outcomes for corroborative evidence for the hypothetical Matrix Model 2.

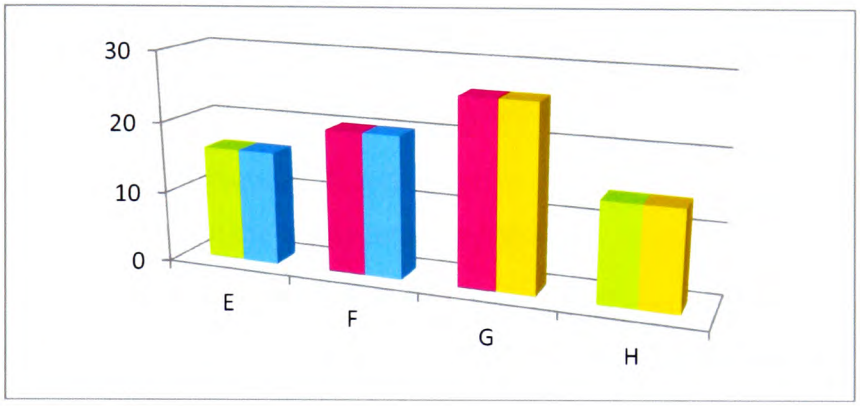
12.6 Statistical Outcomes for Corroborative Evidence for Matrix Model 2 e-Moderator perceptions of what e-learners are able to do online.

Figure 12.2 shows the outcomes for Model 2 indicating the ways in which the combinations of constructs (F5,F6,F7 and F8) were distributed in the coded fragments found in a total number of e-moderator statements (n=76), slightly more than the total number (n=72) which corroborated Model 1.

Figure 12.2 Number of statements in each of the 4 Categories (E, F, G, H) and the distribution of their associated constructs (F5, F6, F7 and F8) in Matrix Model 2

Model 2	E	F	G	H	
	F5 16	F6 20	F6 26	14	76
	F7 16	F7 20	F8 26	F8 14	76
					76
	16	20	26	14	Statements

Graph 12.2 Bar Chart Distribution of constructs as corroborative evidence for Hypothetical Matrix Model 2 based on e-moderator perceptions of what e-learners are able to do online.



KEY: Colour Codes in above Bar Chart 12.2

y-axis	=Frequency of verbatim statements	**construct**
	High Collaborative Capability Construct	F5
	Low Collaborative Capability Construct	F6
	High Knowledge Construction Ability Construct	F7
	Low Knowledge Construction Ability Construct	F8

The bars in Graph 12.2 Bar Chart show the combination and distribution of collaborative capability and knowledge construction capabilityl constructs in each of the quadrants D, E, F, and G, as shown in the list below:

For Quadrant E, 16 statements had the combination of constructs F5 and F7
For Quadrant F, 20 statements had the combination of constructs F6 and F7
For Quadrant G, 26 statements had the combination of constructs F6 and F8
For Quadrant H, 14 statements had the combination of constructs F5 and F8

12.7 Statistical Outcomes for Corroborative Evidence for Matrix Model 3 for Pedagogical Variation for online learning and teaching

This part of the presentation of the research outcomes brings into focus the extent to which corroborative evidence is meaningful in deciding whether a conceptual framework is worth considering further.

Figure 12.3 below indicates how the corroborative evidence was distributed in each of the four categories (AE, BF, CG and DH) in Model 3, for *Pedagogical Variation* for online learning and teaching in asynchronous discussion forums.

Figure 12.3 Number of statements in each of the 4 Categories (AE, BF, CG, DH) in Matrix Model 3

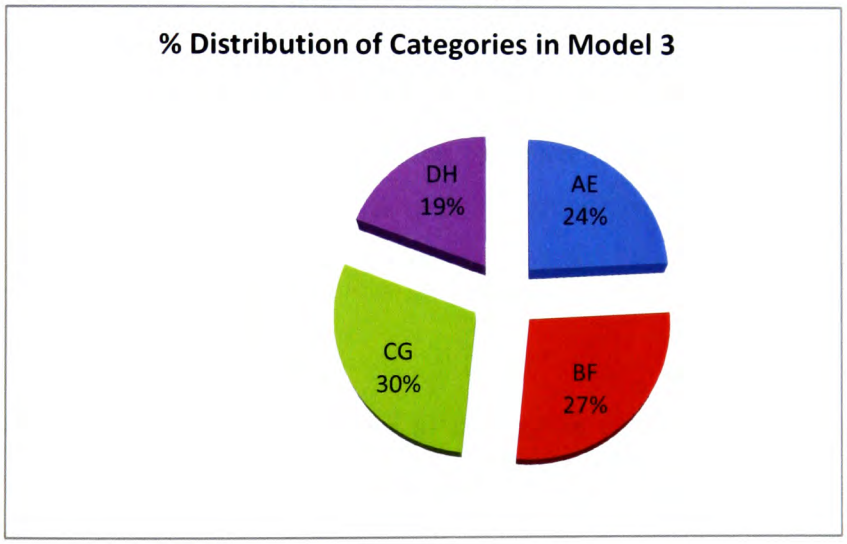
Model 3

AE	BF	CG	DH	
24	27	29	19	99

Total statements in each category which matched the coded criteria

Graph 12.3 shows the distribution of corroborative evidence in the outcomes for all four categories AE, BF, CG and DH in the hypothetical Model 3.

Graph 12.3: Pie Chart



The rank order of corroborated quadrants making up the whole of Model 3 is shown to be-

(i)	CG	30%
(ii)	BF	27%
(iii)	AE	24%
(iv)	DH	19%

These findings were a useful measure for comparison with results from Empirical Study 2 in which I aimed to test Model 3. I discuss the ratio of the corroborated evidence in each of the categories (AE, BF, CG and DH) in the next chapter.

12.8 Summary

This chapter showed the ways and means by which the vast amount data at hand was analysed with, in certain aspects, meagre outcomes. A number of issues which, at the time seemed almost insurmountable were identified. Nevertheless, the process of analysis provided greater insight with a much better understanding of how to design a research investigation. With hindsight and reflection-on-action it was an ambitious endeavour to attempt such a study using Personal Concept Psychology where the unbiased freedom of respondents brought about an increasing accumulation of data which was put aside because much of the data did not fulfil the rigid criteria of the coding templates. The research design was much influenced by the research literature which offered a plethora of insights into online learning and teaching which guided the research in a focused direction.

However, what has come about, despite despondent criticism, is a fresher insight to what it is to become an effective researcher. The experience of the 'messiness' of analysing heaps of data and only finding a nugget of prize-value became significant. The hypothetical Matrix Model 3 has stood up to testing, whether the magnitude of corroboration is sufficient or not. The research findings offer opportunities to pursue the conceptual design for the *Pedagogical Variation* model with further better and well designed research strategies.

A brief interpretation of the pedagogical insights in each of Matrix Model 3 categories is suggested as follows:

Category AE resembles a more likely constructivist learning environment.

Category BF resembles a more likely learning environment for independent, self-directed learners.

Category CG resembles a more likely instructivist learning environment.

Category DH resembles a more likely collaborative learning environment but with little knowledge construction.

In the next chapter, Chapter Thirteen, the findings of the hypothesis testing procedure are discussed.

Chapter Thirteen

Hypothesis Testing

Outcomes of Empirical Study 2

13.0 Theoretical Assumptions

"Assumptions make messes researchable, often at the cost of oversimplification and in a way that is highly problematic." This quote from Morgan (1983:377) gives a reminder that the 'taken-for-granted' assumptions which underpin many research investigations frequently escape rigorous scrutiny, thereby jeopardizing the value of research outcomes. Turner (2004:69) concludes that "as soon as we start applying language to describe situations we import a whole range of theoretical assumptions".

This chapter begins with a note regarding the limitations of research which fails to articulate the nature of underlying assumptions. At the beginning of the research investigation, there was recognition of the importance of establishing explicit statements which describe the assumptions made. In the second empirical study, it was essential to make explicit the assumptions which underpin the conceptual frameworks for Model 1, Model 2 and Model 3, so as to be able to make a conscientious attempt to falsify them (Popper, 2002:57) using the test instrument. The research study has not left unexplained any assumptions that might be interpreted as common sense, nor has the research study made taken-for-granted statements. If such statements were left unexamined, the research study would run the risk of failure in recognising potential falsifiers (Popper, 2002:57). "By describing a meeting as a lesson, or a person as a pupil, we build in a whole range of assumptions around the likely and possible interactions which take place within that setting. These assumptions are more dangerous, not less, if they are smuggled in as common sense, or left unexamined" (Turner, 2004:69)

The research investigation up to this point was firmly anchored in the rationale underpinning the design of a conceptual model for teaching and learning online in asynchronous discussion forums. The assumptions made about aspects of teaching (i.e. what e-moderators do online) in two dimensions, namely transactional as task giving and transformational as motivational support have been explained at length (Chapter Six). The assumptions made about aspects of learning (i.e. what e-learners are able to do online) in two dimensions, namely collaborative capability and knowledge construction ability have also been explained with integrity (Chapter Six). It was also important to emphasise the

nature of asynchronicity and connectivity in online asynchronous discussion forums (Chapter Two) because these were fundamental affordances provided by the infrastructure of the electronic learning and teaching platforms.

The final empirical stage in the research study was the data collection from the hypothesis testing online questionnaire. This research instrument was designed to evaluate whether the theoretical assumptions for Model 3 would stand up to public scrutiny or whether there would be mounting evidence to the contrary, with plausible rival explanations in falsification.

13.1 Trialling Falsification

The sampling frame consisted of e-moderator practitioners with a minimum of three years experience. By using the technique of snowballing it was possible to contact e-moderating practitioners from differing geographical areas including Birmingham, Bradford, Cardiff, Coventry, Liverpool, London, Newport, Swansea, Vienna and the USA. 35 questionnaires were sent out (Appendices C1 and C2) as email attachments of which twenty one returns were obtained. A calculation of the response rate (21/35) x 100%, gives a response rate = 60%.

In finding respondents by a snowballing strategy, it was realised realise that there may be participant bias in contrast to random sampling strategies. However, the response rate proved to be good and representative of online teachers and there was little necessity in chasing up those who were unable to return their responses by the deadline.

13.2 Examination of the first four questions

The first four questions provided brief descriptions of online teacher behaviour (i.e. Hypothetical Model 1 assumptions). The respondents were required to answer, with their reasons, the open-ended question – 'What kind of e-learning group would this be appropriate for?" That is to say to provide descriptions of online learners' preferences with expected outcomes to match Hypothetical Model 2 assumptions.

The following four sub-sections provide tabulations of the findings as statements recorded in the answer boxes by respondents. These findings are recorded in two parts namely (i) typical shared understandings and (ii) alternative viewpoints.

13.2.1 Quadrant A

(i) Typical Responses reflecting shared understandings

This section records the online e-respondents' comments for Quadrant A in Table 13.1 below. These comments reflect and corroborate the assumption made in the conceptual framework of Model 3 for Quadrant AE i.e. that in a highly collaborative, constructivist e-learning environment, e-teacher presence is less visible, with both low transactional, task-giving behaviour and less transformational, motivational support. It is assumed that the e-learning group can encourage each other with shared ideas to generate their own knowledge construction, without much e-teacher intervention.

Table 13.1 E-respondents' responses to Quadrant A in Model 1 corresponding to underlying assumption of Conceptual Framework

Item No.	Respondent ID	Responses to Quadrant A Matching Underlying Assumptions of Conceptual Model 2 (Quadrant E)
1	R02	"Highly self motivated, experienced, independent learners who also are not able to progress their studies on a structured basis, perhaps due to varying work demands"
2	R04	"Self –motivated, mature students who would be capable of working on their own initiative together with others. Maybe those students who are experienced at e-learning."
3	R07	"Potentially a self-led student group, completing an assignment or group work, which requires observation from the tutor, but would be compromised by interference"
4	R09	"An already well-motivated group with clear ideas of their own and the ability to make good progress by themselves. The online tutor needs only to act in a supervisory capacity"
5	R11	"Experienced, very motivated e-learners can collaborate effectively to develop own ideas in a learning community where everyone is willing to share each other's expertise. They do not depend on e-tutor support but value e-tutor presence."
6	R12	"This group of e-learners would be confident in working together online and getting on with their work by developing different ideas together with creative thinking. Although they might be self-diredted, they do like online teacher to monitor their progress"
7	R15	"Self-motivated learners who can work well independently from e-tutor, seeking help amongst each other in the peer group."
8	R18	"This would be for students who would not need a lot of support because they are enthusiastic to work together online and would be capable of completing the work with lots of original shared ideas"
9	R19	"When e-peers are fully occupied in working out problems together they wouldn't need e-teacher intervention. They would probably be self-directed, intelligent and hard working."
10	R20	"self-motivated e-learners who can collaborate well, sharing lots of ideas with little need for online tutor support"

The responses above reflect the respondents' shared understanding that student key characteristics would include self-motivation, collaboration, and willingness to share ideas

with little need for e-tutor intervention, neither by task-giving nor motivational support. Interpretations of these outcomes are discussed in the next chapter, Chapter Fourteen.
The next section records those insights given by e-respondents which differ from those shared understandings in the above table.

(ii) Alternative Viewpoints

When it was realised that there were some responses which highlighted other viewpoints it was necessary to find a strategy on how best to record them because they would contribute some valuable insights. These statements provided a means to detect, or not, potential falsifiers to corroborate an alternative rival theory or falsifying hypothesis (Popper, 2002:66) for the conceptual hypothetical Model 3. These individual viewpoints are recorded in Table 13.2 below.

Table 13.2 Alternative viewpoints relating to Quadrant A

Item No.	Respondent ID	Responses to Quadrant A Alternative Viewpoints
11	R01	"I expect the tutor might intervene at crisis moments. Alternatively tutor observation could be simply to monitor participation – so that this can be chased up via other communication channels if necessary."
12	R06	"Am assuming this is based on assumption that the "online presence" would be text / written information only? In which case, this would be the equivalent of a lecture (i.e. didactic) Seems not to favour the "group" – or indeed, learning! BUT a) Could be valued by the "self contained" individual learner b) Could have the (presumably unintended) consequences of nurturing collaboration amongst the group members to make up for lack of direction and motivation!"
13	R14	" A group following set learning materials which require little input unless students require help"

The above responses seem to reflect an alternative viewpoint to those responses which reflect shared understandings of the situation, in Table 13.1. The relevance of these outcomes is discussed in the next chapter, Chapter Fourteen. The outcomes for Quadrant B are given in the following section.

13.2.2 Quadrant-B

(i) Typical Responses reflecting shared understandings

This section records ten statements from e-respondents which reflect their shared perspectives regarding the situation described in the question where the e-teacher gives a lot of tasks and little motivation. Table 13.3 below shows the ways in which e-respondents described the e-learning group which they felt would benefit from the teaching style described.

Table 13.3 E-respondents' responses to Quadrant B in Model 1 corresponding to underlying assumption of Conceptual Model

Item No.	Respondent ID	Responses to Quadrant B Matching Underlying Assumption of Conceptual Model 2 (Quadrant F)
43	R01	"Independent, egocentric learners, unable to collaborate online; **self**-directed and can cope with lots of tasks to keep them busy."
44	R05	"Motivated on-line learners who are comfortable with demands of independent learning, and are experienced and comfortable in on-line environment, but do not collaborate very well. Like to have many problem-solving activities to remain actively engaged."
45	R07	"A very capable group, well-motivated and eager to get teeth into a lot of online activities. Prefer to work on their own. Little collaboration; Independent and self-directed."
46	R09	"Capable learners with high self-autonomy; enjoy online learning with lots of tasks. Unlikely to share each other's ideas."
47	R12	"Inventive, independent students. Have good ideas and need to be given many challenging problem-solving tasks to get on with. Have a high degree of self-confidence but do not like to exchange their expertise with others"
48	R13	"An e-learning group which thrives on numerous online activities; highly motivated, self-directed e-learners with little desire to share ideas because of egocentric approach to study"
49	R16	"These students are actively engaged in numerous online activities but are unable to collaborate with each other because of their individualistic approach to learning."
50	R18	"Hard-working, very capable, autonomous students who have a serious approach to their study and don't like to dilly-dally. Do not take the opportunity to collaborate because completely focused on active engagement with numerous online tasks, independent from others."
51	R20	"Self-centred, keen students who prefer to work independently, without exchange of ideas, seeking self-improvement by doing a lot of work online."
52	R21	"Independent, very efficient, optimistic online students, able to manage a heavy workload due to their excellent problem-solving skills, needing lots of activities to keep actively engaged online. Very little inter-dependence, if any at all with reluctance to work together."

These responses reflect a shared understanding that e-learners in this grouping are very capable, well-motivated, experienced in online learning, independent and self-directed. The above typical responses corroborate the conceptual framework for quadrant BF in Model 3. These outcomes are more fully explained in Chapter Fourteen

(ii) Alternative Viewpoints

Four different viewpoints regarding this quadrant were found. These are shown in Table 13.4 below. They provide additional insight to the ways in which experienced e-moderating practitioners view their online roles. Interpretations with regard to how they may fit into the conceptual design are discussed in the next chapter, Chapter Fourteen.

Table 13.4 Alternative viewpoints relating to Quadrant B

Item No.	Respondent ID	Responses to Quadrant B Alternative Viewpoints
53	R03	"The absence of motivational support could suggest a lack of feedback to students. The only context where this could normally be acceptable is one where students are being given new tasks based on previous tasks, such as decision-making exercises."
54	R08	"The e-learners in the group could be actively involved in several simulation or role-play exercises where the tutor is trying to suggest 'real-world' situations but cannot provide feedback effectively because e-learners are 'captivated' by their own interpretations."
55	R14	"The e-learning group might be 'seduced' by the online simulations, requesting more to be given to them online, but do not need feedback from the online teacher because the software provides this automatically."
56	R17	"The e-learning group might be doing a lot of online tests for accreditation and would not expect immediate feedback from the online teacher who sets the online tests."

Taking a closer look at the above four alternative statements, it was recognised that there are several valuable interpretations to the understanding of the question for Quadrant B.

13.2.3 Quadrant-C

(i)Typical Responses reflecting shared understandings

Ten typical responses which reflect e-respondents' shared understanding for Quadrant C question were selected. These are recorded in Table 13.5 below. The next chapter, Chapter Fourteen, discusses how these statements corroborate the assumptions for Model 3.

Table 13.5 E-respondents' responses to Quadrant C in Model 1 corresponding to the underlying assumption of the Conceptual Model 1

Item No.	Respondent ID	Responses to Quadrant C Matching Underlying Assumption of Conceptual Model 2 (Quadrant G)
28	R03 T	"A group needing quite a lot of pushing and direction to get going. Lots of tasks provide something concrete for the group to get into. Support needed to push group into thinking they can achieve these tasks"
29	R05	"This approach would appear to work best for groups who want to engage with their online learning in several "bite size chunks" with regular engagement and lots of encouraging feedback"
30	R06	"*Newbies* who are completely new to e-learning and the particular topic, needing lots of motivation to come online to engage in peer-group activity with a lot of 'simple' tasks. Possibly 'lurking'.
31	R08	"Less able students who need more e-teacher centred instruction with a great deal of personal encouragement to try out lots of easy online tasks."
32	R10	"'*Lurkers*' who need a lot of encouragement to come online and many appropriate tasks to engage in. Possibly feeling uncomfortable to post their ideas at risk of being 'ridiculed online' when everything is open to public view.
33	R11	"Maybe '*shirkers and lurkers*' reluctant to come online- needing instructivist climate / e-learners need e-teacher centred environment; lots of tasks and lots of motivational support."
34	R14	"Those who can't get to grips with the online course, having little knowledge of the subject; no self-confidence and refrain from collaboration in case they are 'misunderstood' or seen as a 'dim-wit'". It is often a good idea archiving tasks in detail which are easily accessible."
35	R17	"Nervous e-learners who are unable to see beyond a problem and who get easily confused, so they don't bother come online, dreading the thought that they may be 'put down' by others. The e-teacher needs to be sensitive to this by communicating to them with personal emails"
36	R19	"Some students fear humiliation online which prevents them from participating in discussion groups. They 'lurk' and access archived resources, trying to keep up. They need lots of encouragement."
37	R20	"Young and lazy online students who can't be bothered to come online unless they are given a lot of personal attention. Lots of appropriate tasks can encourage them to join in a discussion group, but for these kinds of e-learners problem-solving is difficult."

These responses from respondents reflect a shared understanding that e-learner characteristics are exemplified by lurking as well as those students who need to be encouraged by many bite-size chunks and Newbies (novice, first-time, e-learners) lacking experience of online interaction.

These typical responses indicate a shared meaning which corroborates the conceptual framework for Quadrant CG in Model 3, because the key words used imply that e-learners find difficulty, collaborating or coming online (i.e. low collaborative capability) and that they find it hard to understand the work (i.e. have low knowledge construction ability).

(ii) Alternative Viewpoints

Four alternative viewpoints were collected which were different from the above ten shared understandings of e-respondents recorded in the above table. These were regarded as a valuable contribution to the way in which e-respondents consider the situations described in the questions. A discussion on how these may or may not point to potential falsifiers will be found in Chapter Fourteen. These viewpoints are shown in Table 13.6 below.

Table 13.6 Alternative viewpoints relating to Quadrant C

Item No.	Respondent ID	Responses to Quadrant C Alternative Unexpected Viewpoints
38	R01	"Maybe these students have problems with 'absence of body' in communicating"
39	R04	"The e-learners might be afraid of coming online due to loss of 'personal presence'- no facial expressions, no hand gestures and intonation of voice."
40	R13	"the e-learners would feel uncomfortable with self-disclosure often perceived to be a central component for bringing a community of online learners together"
41	R15	"e- learners who want to study in a structured manner but who need support in developing on-line learning skills, especially in relation to using the hardware and software".
42	R18	"This e-learning group would be affected by a sense of isolation due to 'invisible others' and would expect online teacher to give them as much guidance as possible to reduce their anxiety."

The above responses throw light on an important factor which does not only affect e-learners in this quadrant but also in practice, e-learners and e-teachers have to a certain degree managed to cope with issues raised by absence of body in the online classroom.

13.2.4 Quadrant D

(i) Typical Responses reflecting shared understandings

This section records the online e-respondents' comments, in Table 13.7 below for Quadrant D in Model 1. These comments reflect and corroborate the assumption made in the conceptual framework of Model 3 for Quadrant DH i.e. that in a more collaborative e-learning environment, e-teacher presence is needed with less transactional, task-giving behaviour and more transformational, motivational support where e-learners find tasks difficult. It is assumed that the e-learners in this group find the work tough going, with

little knowledge construction by their own initiative. Chapter Fourteen, Section 14.4.4(i) discusses the significance of this data.

Table 13.7 E-respondents' responses to Quadrant D in Model 1 corresponding to the underlying assumption of Conceptual Framework

Item No.	Respondent ID	Responses to Quadrant D Matching Underlying Assumption of Conceptual Model 2 (Quadrant H)
14	R01	"motivated students who want to learn, but not much self-confidence and who depend on help from e-teacher"
15	R03	"A group lacking self-confidence and who struggle with learning concepts. Willing to try things out but need few tasks, not many to get on with"
16	R04	"The "essence" of this kind of support would seem to favour the encouragement of developing a "community" of learners who are able to negotiate their way towards different learning outcomes Some in this group may struggle more than others because they are unsure of their own contributions."
17	R06	"Learners lacking confidence and requiring assurance regarding on-line learning processes; perhaps lacking motivation and experience as independent learners. Finding some tasks too complicated."
18	R09	"This would apply to e-learners who are willing to support each other but are struggling with the work and need a lot of encouragement (motivation) to boost their self-confidence. They would only be able to cope with a few tasks at a time."
19	R11	"A group of newcomers who are unfamiliar with the topic and need a lot of coaxing to get started with a few tasks. Not very self-confident; maybe a group of *'mature students'* returning to academic studies after a long break from school/college."
20	R13	"Learners in this group would probably like to take their time; don't like to be rushed with work, but will make an effort with gentle persuasion. Usually enjoy each other's company."
21	R15	"A group of e-learners who like to take time to discuss a topic online before sending in written work. This means that the e-teacher is unable to give them more tasks. They always look for encouragement and help/ guidance to complete a task before starting another one.
22	R16	"People new to e-learning, needing lots of support and encouragement, especially when they are learning a new subject. They make progress little by little, being able to cope with fewer tasks rather than too many at once."
23	R21	"Maybe for a group of *'slowcoaches'* who need more time to do the tasks. Less self-reliant depending a lot on encouragement from e-teacher. Like learning in a group to support each other too."

(ii) Alternative Viewpoints

Four responses which highlighted different viewpoints from those shared understandings are recorded in Table 13.8. These again contribute some further valuable insights for which interpretations are given in the next chapter, Chapter Fourteen.

Table 13.8 Alternative viewpoints relating to Quadrant D

Item No.	Respondent ID	Responses to Quadrant D Alternative Unexpected Viewpoints
24	R05	"This might be in the context of students providing self-reflective content online (such as personal diaries), or who are conducting collaborative research, such as producing Wiki content on self-selected themes."
25	R10	"Students who are more familiar with the topic so require fewer tasks but who need a little more motivation."
26	R14	"A group discussion requested by students who are following set learning materials and who would seek advice on how to set about it."
27	R18	"In this situation, where the student is driving content creation, the online teacher would be providing feedback on the quality of reflections/research, urging new participation, and asking challenging questions to develop thinking or praising submissions where students lack confidence."

This section concludes the findings from Section A questions. The outcomes of Section B on the questionnaire are discussed in the next section, Section 13.3.

13.3 Examination of Section B: Matching e-moderator perceptions of what they do online and their perceptions of what e-learners are able to do online

This section records and describes the outcomes of Section B on the Test Questionnaire. The number of returns=21 out of a possible 35 responses. The outcomes of Section B are recorded both in table format and graphically for ease of interpretation. The analysis began with the four matching procedures. The results of matching the quadrants in Model 1 (A, B, C, D,) with the quadrants in Model 2 (E, F, G, H) is shown in Table 13.9 below. The column sums which equal 21 refer to the actual totals for the number of e-respondents giving their responses for each of the four categories, namely good fit, bad fit, doesn't matter and don't know, for each of the four quadrants AE,DH,CG and BF.

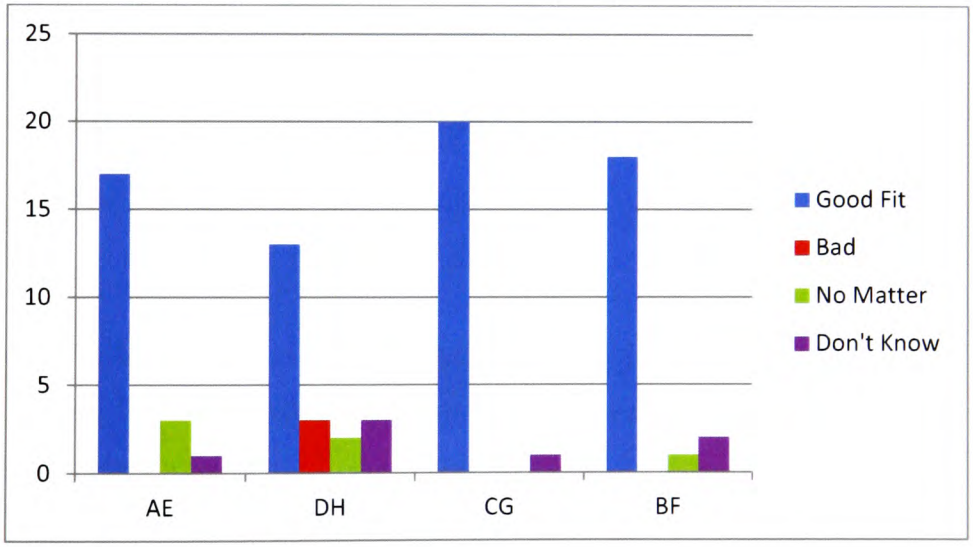
Table 13.9 E-responses from e-respondents' raw numerical data in matching Model 1 and Model 2 Quadrants

	AE	BF	CG	DH	Sub-Total
Good Fit	17	18	20	13	68
Bad Fit	0	0	0	3	3
Doesn't Matter	3	1	0	2	6
Don't Know	1	2	1	3	7
	21	21	21	21	84

From the results in Table 13.9, above it can be noticed that out of the four quadrants belonging to Model 3 after matching the quadrants in Models 1 and 2, quadrant CG had gained the most matches as good fit (i.e. good fit=20, equivalent to 95% of possible responses for this item) and quadrant DH the least matches as good fit (i.e. good fit=13, equivalent to 62% of possible responses for this item). This quadrant, DH, seemed to be the only problem. This quadrant was the only one which had gained responses for bad fit=3 (i.e. 14% of possible responses for this item). This instance is further discussed in a later section, in Chapter Fourteen, Section 14.5.

A graphical illustration of these outcomes is given in a bar chart as shown below.

Graph 13.1 Bar Chart Results of matching Model 1 and Model 2 Quadrants using raw numerical data of e-responses



13.3.1 Matching Process: Sample Group comments with respect to their responses

On examination of the reasons given in the 21 e-respondents responses, a number of shared understandings were identified. From the amount of feedback received it became necessary to

consider, carefully, how best to report the outcomes. It was decided to select the data for each of the four categories, good fit, bad fit, doesn't matter and don't know, using data from each of the four quadrants AE, DH, CG and BF in succession in a list.

The list starts with reasons for good fit, then bad fit followed by doesn't matter and lastly don't know, for each of the four quadrants in succession. Firstly, the data for the category 'good fit' are analysed.

(i) Good fit

A total of 68 e-responses were received as good fit during the matching process. This means that a total of 68 e-responses out of a possible 84 that is if the whole sample of 21 e-respondents had reported that all quadrants were a 'good 'fit', gives an overall percentage of 81%. I discuss the implications of this further in Chapter Fourteen.

(a) For AE

The majority of e-responses for this quadrant (n=17) gave an overall percentage of 81% as 'good fit'. Typical statements underpinned shared understandings. Examples of these are listed below:

1) *"This is just what I do myself with my e-learning group";*
2) *"It's a very good match because online students need their 'own space' to share and exchange ideas, without continuous intervention by online-teacher"*
3) *"It's a perfect match. E-peers who enjoy collaborating and solving problems together should be given the opportunity to do this. The online tutor presence is still valued but does not need to be so 'visible'".*
4) *"The social construction of knowledge underpins online learning, so the online teacher should let highly motivated and capable students get on with it without giving too many tasks."*
5) *"It's how I organise my hardworking online students."*

(b) For DH

The majority of e-responses for this quadrant (n=13) gave an overall percentage of 62% as a good fit. Typical statements underpinned shared understandings. Examples of these are listed below:

1) *"It's a good match because when online students realise that it's tough to get on with an online activity, they almost give up, so they need a lot of encouragement and not too many tasks- i.e. a few at a time.*
2) *"I agree. A perfect match. It's difficult enough to keep students who struggle motivated without having to give them loads of work to do."*
3) *"Online teaching isn't about giving numerous online things to do- It's more like encouraging them to give it a try, especially when students are unfamiliar with the topic and don't know where to start."*

4) *"This match reflects what I do online and it works for my students."*

(c) For CG

This match is the most favoured. The majority of e-responses for this quadrant (n=20) gave an overall percentage of 95% as a good fit. Typical statements underpinned shared understandings. Examples of these are listed below:

1) *"A perfect match to encourage everyone to come online, especially those who have a habit of 'lurking'.*
2) *"I think this is a good match because it respects the e-learners who are anxious about 'getting things wrong online' and those who are too timid to 'experiment with ideas'."*
3) *"It's a good match because online students who cannot collaborate and who have difficulty in solving problems need a lot of encouragement and lots of tasks which they can do."*
4) *"Many online students are like this. Collaboration is almost non-existent and they lack self-confidence to tackle an online activity. The online teacher is there to give a lot of motivational support and tasks that appropriate for the ability of the learner."*
5) *"The match is good because an e-learning group that does not collaborate effectively and gets into difficulties when problem-solving feels more comfortable in a teacher-centred, 'instructivist' learning environment."*
6) *"A good match in many ways. Online teacher has the opportunity to give a lot of stimulating tasks and frequent feedback. The online students can feel safe and that they are valued and welcomed online, especially the lurkers and shirkers."*

(d) For BF

The majority of e-responses for this quadrant (n=18) gave an overall percentage of 86% as good fit. Again, typical statements underpinned shared understandings. Examples of these are listed below:

1) *"A very good match. I do the same when I have independent, self-directed online students who are eager to get on with lots of tasks. They don't need a lot of motivational support because they already are very keen to complete the work on time."*
2) *"Perfect match. Busy online learners who do not like to collaborate with others too much, are independent learners who like a lot of tasks to get on with, on their own. Neither do they need lots of encouragement because they are highly motivated to get tasks done efficiently."*
3) *"Super match. Just what happens in my e-learning group of research students who are always eager to get my advice on research resources and problem-solving activities. Independent and very motivated."*
4) *"A good match. My reason for this is that in my experience as an online tutor I know that when I have very motivated, non-collaborative, but creative thinking online students they thrive on lots of task-giving and do not require additional motivational support."*
5) *"Very satisfactory match. My highly independent, mature online students don't like being fussed. They prefer lots to do, without having to collaborate."*

6) *"Good match. I have a number of egocentric, hardworking online students who will not share each other's ideas. I try to give them lots of tasks to keep them focused on the course material."*

(ii) Bad fit

(e) For AE

None reported.

(f) For DH

Out of the 21 respondents, there were 3 (i.e. 14%) who stated that they felt Quadrant DH was a bad fit. Their reasons are listed below:

1) *It's a bad match. My reason is that if the online teacher is not giving students enough to do they will soon decide to opt out of the online course."*
2) *"Not a good match, because students who are having difficulty in knowledge construction need lots of easy tasks to learn how to cope with the more difficult work."*
3) *"Bad match. The aim would be to improve knowledge construction through tasks."*

(g) For CG and BF

None to report.

(iii) Doesn't matter

(h) For AE

There were 3 out of 21 e-respondents (i.e.14%) who reported that it does not matter what happens in this situation. Their reasons are listed below.

1) *"It doesn't matter because the e-learning group is highly motivated anyway. They work well collaboratively and in the constructivist e-peer environment everyone progresses by sharing ideas."*
2) *"I don't think it matters because the e-learners are in a constructivist environment where they trust each other, share ideas amongst each other and learn effectively like this, anyway."*
3) *"Doesn't matter. Online learning is about knowledge construction by creating, developing and exchanging new ideas in a constructivist environment where online learners are used to collaborating well with each other."*

(i) For DH

There were 2 out of 21 e-respondents (i.e.9.5%) who reported that it does not matter what happens in this situation. The reasons are listed below.

1) *"Doesn't matter. If online learners are struggling they will find a way of asking for help either from the online teacher or from each other."*
2) *"I can't see that it matters. I have mature online students who are quite capable of finding things out on the Internet and tell others about what they have found. It's not up to me to be at their beck and call 24/7."*

(j) For CG

None to report.

(k) For BF

There was 1 out of 21 e-respondents (i.e.4.7%) who reported that it does not matter what happens in this situation. Their reason is shown below.

1) "It doesn't matter in this situation because highly motivated independent online students who are non-collaborative and intelligent will get on with their work whatever."

(iv) Don't know

(l) For AE

There was 1 out of 21 e-respondents (i.e.4.7%) who reported that they did not know what happens in this situation. Their reason is shown below.

1) "I don't know whether the match is good / bad because I have not experienced a situation with students who collaborate well and who are very capable in knowledge construction."

(m) For DH

There were 3 out of 21 e-respondents (i.e14%) who reported that they did not know what happens in this situation. The reasons are shown below.

1) "I don't know. An e-learning group may need fewer tasks if they are struggling but on the other hand they may be able to cope with several easier tasks. It's a matter about the level of difficulty as well as the quantity."

2) "Don't know. I haven't experienced an e-learning group that is struggling with the online course."

3) "Don't know, because it's complicated if the e-learning group has e-learners that find knowledge construction difficult and others that don't."

(n) For CG

There was 1 out of 21 e-respondents (i.e.4.7%) who reported that they did not know what happens in this situation. The reason is shown below.

1) *"I don't know. I wouldn't know what to do in this situation. All my online students have managed to access the learning resources easily and get on with tasks very well."*

(o) For BF

There were 2 out of 21 e-respondents (i.e.9.5%) who reported that they did not know what happens in this situation. The reasons are shown below.

1) *"I don't know .If online students show little collaborative online I would want to give them a lot of encouragement to help them share ideas between themselves. On the other hand I know some e-learners are independent learners, who are usually highly motivated anyway and maybe unsocial at times..."*

2) *"I'm not sure about this. Maybe the e-learners are not collaborating because they feel uncomfortable with 'invisible others' in which case I would think the online teacher might want to encourage socialisation amongst the e-peers."*

This is the last comment to be recorded in this Section 13.3.1. In the next chapter, Chapter Fourteen, the data presented in this chapter are reviewed to discuss interpretations regarding the ways in which the e-moderator research participants agree and to some much lesser extent disagree with the conceptual frameworks for Model 1, Model 2 and Model 3.However, before moving on to the next chapter, this chapter concludes this by summarising the outcomes of the Hypothesis Testing procedure.

13.4 Summary of Outcomes

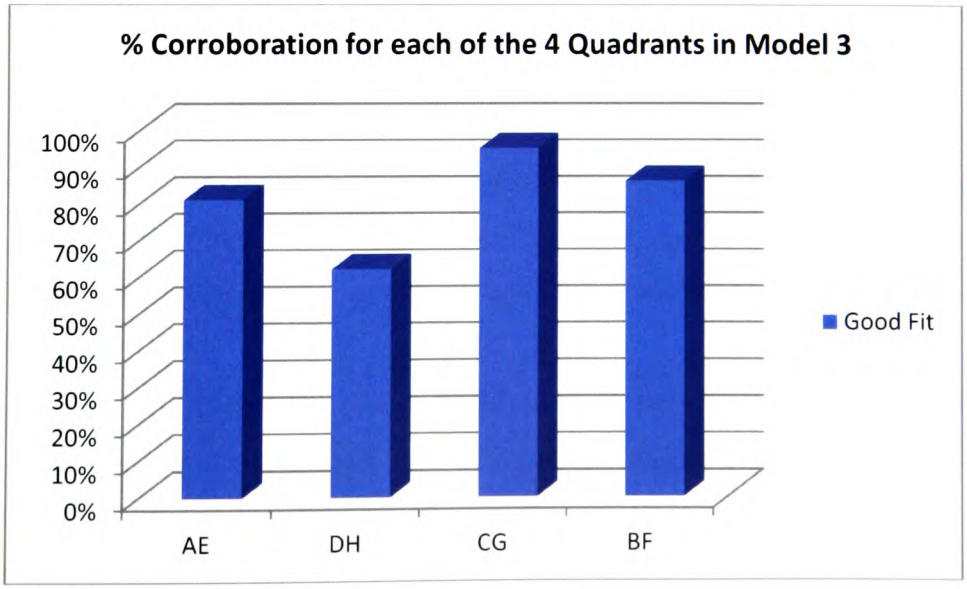
Firstly, the overall percentage outcomes for successfully matching each of the four quadrants namely AE, BF, CG, and DH, in Section B of the online Test Questionnaire for 'good fit' can be seen in the tabulation below, in Table 13.10.

Table 13.10 Results of matching the quadrants in Model 1 with the quadrants in Model 2 for 'good fit'

Quadrants in Model 3			
AE	DH	CG	BF
81%	62%	95%	86%

A graphical representation of the data is given in bar chart as shown below.

Graph 13.2 Bar Chart of Overall Percentage of Good Fit for each of the Quadrants in Model 3 (AE, DH, CG, and BF)

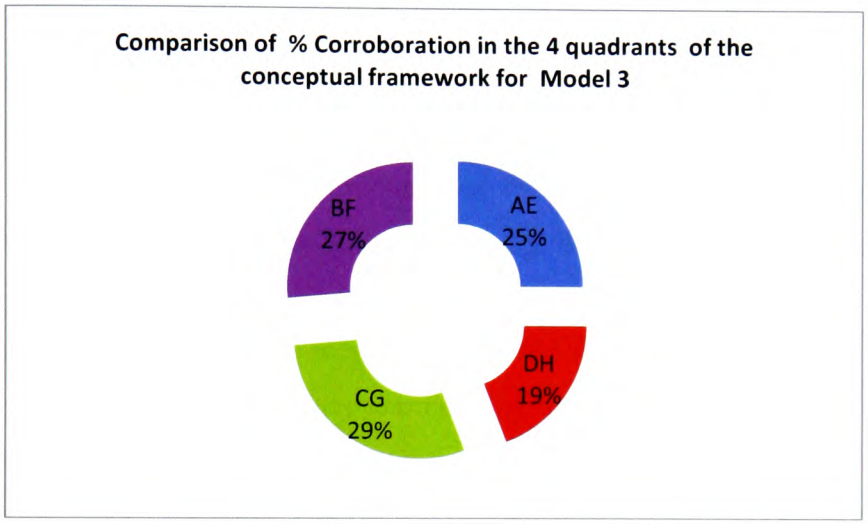


Placing these outcomes in rank order to assess the nature and degree of corroborative evidence the results obtained are shown below:

(i)	First -Highest Respondent %	CG = 95%
(ii)	2nd	BF = 86%
(iii)	3rd	AE = 81%
(iv)	Last –Lowest %	DH = 62%

A graphical representation of the data can be used to show how the percentage outcomes for the four quadrants in the conceptual framework for Model 3 (AE, DH, CG, and BF) relate to one another. The doughnut chart representation seemed to be a good way to do this as illustrated below in Graph 13.3.

Graph 13.3 Doughnut Chart Comparing the Percentage Corroboration in the four quadrants (AE, DH, CG, DH) in the Conceptual Framework for Model 3.



13.4.1 The significance of these results

The significance of these results is that that the most corroborative indication is given for quadrant CG in Model 3.This was confirmed by 95% (Table 13.10) of the e-respondents. In the situation presented by quadrant CG, the e-moderator behaviour responds to the difficulties in collaboration and knowledge construction shown in e-learner online behaviour. Here the e-moderator gives a lot of tasks and a lot of motivational support.

The least corroborative indication 62%, (Table 13.10) is given for Quadrant DH in Model 3. This result may show potential signs for falsification. In Quadrant DH e-learner collaborative ability is high, but knowledge construction is low. The e-moderator behaviour in this situation in the conceptual framework for Model 3 is assumed to be low

in task-giving with a lot of motivational support. This was confirmed as a bad fit by 14% of the e-respondents.

Reasons for a bad match included the response that *"knowledge construction would be improved by giving more tasks"*. This is a rival explanation to the assumption underpinning Quadrant DH, i.e. that those e-learners who are struggling with knowledge construction should not be overburdened with more tasks (i.e. cognitive overload) than they can cope with. There is, perhaps, a problem with the way in which this quadrant is understood. It could be that the questionnaire did not make it sufficiently clear as to what the variables meant. Using the description of a few tasks is insufficiently explicit because for some, five tasks a week may be a lot and for some e-moderators it may be a lot, depending on task-difficulty, for example., the intended meaning to be taken is that if the same number of tasks were given say in a week, then there could be a better comparison in using the description of giving many tasks at a time or a few tasks at a time to describe the amount of task-giving.

This chapter gave a detailed account of the outcomes from the Hypothesis Testing Research Instrument, for both Sections A and B in terms of the responses received, online from 21 e-respondents. These outcomes provide a rich source of data for interpretation and further discussion about the ways in which the three conceptual frameworks, Model 1, Model 2 and Model 3 have been examined by the sample population (n=21) of practising e-moderators. There is yet much to discuss regarding the testability, falsifiability and corroborability of the three models for *Pedagogical Variation*. This discussion is left for the next chapter. In the meantime this chapter concludes in the next section.

13.5 Summary

This chapter presented the outcomes of implementing the online Hypothesis Testing Research Instrument for the evaluation of the assumptions underpinning Model 1, Model 2 and Model 3, the *Pedagogical Variation* model for teaching and learning in asynchronous discussion forums. The comments from e-respondents informed the research that shared understandings existed in the responses to the descriptions of what e-moderators do online with respect to the conceptual framework for Model 1, in Section A of the online questionnaire. It is also clear, from the data obtained in Section B, that corroboration was achieved when matching the quadrants from Model 1 (A, B, C, D) and Model 2 (E, F, G, H). The resulting matches (AE, BF, CG, and DH) belonging to the conceptual framework for Model 3 were then carefully analysed. By doing this it was possible to determine to

what extent the conceptual *Pedagogical Variation* model (i.e. Model 3) for online teaching and learning could be refuted (Popper, 2002:66)..

Whilst there are limitations to this investigation, it is impossible to make a generalised claim. It can be, however, tentatively suggested that online teaching appears to be situational with respect to e-learner learning behaviours online. In the next chapter, Chapter Fourteen, the data, presented in this chapter, is reviewed with a critical lens, giving interpretations of what the outcomes reveal about each of the three conceptual frameworks for Model 1, Model 2 and Model 3 when they are put to the test.

Chapter Fourteen

Discussion of the Outcomes

Empirical Study 2

14.0 Introduction: Critical Issues

The following quote from Kuhn (1971:65) sums up what it is like to embrace research in the quest of finding a rare gem of knowledge:

"Novelty ordinarily emerges only for the man who, knowing with precision what he should expect is able to recognize that something has gone wrong. Anomaly appears only against the background provided by the paradigm ... In the normal mode of discovery, even resistance to change has a use ... By ensuring that the paradigm will not be easily surrendered, resistance guarantees that scientists will not be lightly distracted and that the anomalies that lead to paradigm change will penetrate existing knowledge to the core."

In the previous chapter, the outcomes of the e-respondents were recorded and it emerged that whilst there was evidence of shared understandings in the agreement of the conceptual *Pedagogical Variation* model, there were a number of alternative viewpoints. One quadrant in particular caused disagreement. From the above quote Kuhn (1970:65) concludes that anomalies highlight "that something has gone wrong". In this chapter an interpretation for some anomalous outcomes may lead to further insights about the design of the Hypothesis Testing Research Instrument. This chapter also looks at the significance of explicitly stating the underlying rationale in creating an innovative pedagogical approach for online teaching and learning.

From another aspect, some existing theoretical frameworks for online teaching and learning (Chapter Four) which adhere to constructivism appear to be loosely interpreted (Gulati, 2004) with implications of teacher-led strategies (e.g. teacher designed activities), denying online learners a real choice in generating their own problem-solving activities.

This can be contrasted to a stricter adherence to a constructivist approach where online students have the freedom to explore and determine their own problem-solving tasks and solutions, through collaborative e-peer support.

This chapter is of great significance to the whole of the research investigation, because it discusses how the three conceptual models, namely, Model 1, Model 2 and Model 3 stood up to a somewhat rigorous test instrument, i.e. the online self-report questionnaire which was

completed by experienced practising e-moderators (n=21). This part of the investigation focused on the evaluation of the *Pedagogical Variation* model, in an attempt to ascertain to what extent e-moderators agree or not with the conceptual design of the *Pedagogical Variation* model.

Chapter Six gave a brief account of the ways in which the three hypothetical models (Model 1, Model 2 and Model 3) were conceptualised and corroborated (Chapter Eight) by e-moderator statements (n=392) during the elicitation of their perceptions of their online roles and relationships. Fragments from these statements were coded according to coding templates (Appendices B4 and B5) so that they could be further analysed with respect to their inclusion or exclusion in any one of the three conceptual frameworks. This was an extremely, arduous, time-consuming process, but a sound basis for understanding the rigour essential for fruitful research. A certain degree of corroboration was achieved to establish working definitions and "basic statements" (Popper, 2002:66-67) for the components contributing to each of the conceptual models.

Before any hypothesis testing could be carried out it was important to make explicit what it is that was to be measured (Babbie, 2004:48). "Because a hypothesis makes a prediction (what ought to be) about the relation between two variables, it must be testable, in order to determine if the prediction is right or wrong when examining the results obtained in the study. A hypothesis must be stated in an unambiguous manner to be clearly testable".

Clear explanations were provided for each pair of variables underpinning each of the Models I and 2 (Chapter Six). The merging of these two models gave rise to the resultant Model 3 consisting of four variables. In addition, each variable has two constructs (Model 1 low - high / Model 2 high - low). In Model 1, the two variables (i) task-giving (transactional behaviour) and (ii) motivational support (transformational behaviour) are both independent of each other and can co-exist together (Chapter Six, Diagram 6.1).

In Model 2, the two variables (i) collaborative capability and (ii) knowledge construction ability are both independent of each other and can co-exist together (Chapter Six, Diagram 6.2).

In Model 3, in which Model 1 and Model 2 are merged, there are four underpinning assumptions about online teacher behaviour (dependent variable) and e-learner behaviour (independent variable). These four assumptions, underpinned by "basic statements" (Popper, 2002:66-67) are listed below:

(i) For an e-learning group which has high collaborative capability and has high knowledge construction ability an e-moderator behaviour is characterised by low task-giving and low motivational support; (Quadrant AE Assumption)

(ii) For an e-learning group which has little collaborative capability and high knowledge construction ability an e-moderator behaviour is characterised by low task-giving and low motivational support; (Quadrant BF Assumption)

(iii) For an e-learning group which has little collaborative capability and little knowledge construction ability an e-moderator behaviour is characterised by high task-giving and high motivational support; (Quadrant CG Assumption)

(iv) For an e-learning group which has high collaborative capability and little knowledge construction ability an e-moderator behaviour is characterised by low task-giving and high motivational support; (Quadrant DH Assumption).

The hypothesis underpinning the situational nature of the conceptual *Pedagogical Variation* model, in unambiguous terms, is this:-

"Teacher online behaviours vary according to e-learner online behaviours".

The four predictions or four assumptions were put to the test by using the hypothesis testing research instrument; a self-report online questionnaire with open-ended questions in Section A (Chapter Ten) which elicited from e-respondents their conceptualisation of the types of e-learning group they thought would benefit most from each of the four online teaching behaviours. A diagram, illustrating the four quadrants (i) A as Constructivist (ii) B as Individualistic (iii) C as Instructivist (iv) D as More Collaborative (Chapter Ten, Section 10.4, Figure 10.1) was provided to exemplify the concept of *Pedagogical Variation* for online teaching.

In Section B of the Hypothesis Testing Research Instrument, a second diagram included four quadrants (Chapter Ten) illustrating e-learner behaviours (i) Quadrant E as a Learning Team (ii) Quadrant F as self-directed Egocentric Participants (iii) Quadrant G as Shirkers and Lurkers (iv) Quadrant H as Triers and Stickers. The four questions asked e-respondents to evaluate whether the online teacher behaviour matched the e-learning group characteristics. There was a choice of four answers (i) good (ii) bad (iii) Doesn't matter (iv) Don't know.

An initial pilot sample (n=5) was used to ensure that the questions in both sections of the Hypothesis Testing Research Instrument, Section A with Figure 10.1 (Model 1) and Section B with Figure 10.2 (Model 2) were understandable by e-respondents. It was essential to determine whether the Hypothesis Testing Research Instrument had been designed to measure what it was meant to measure. It was difficult to ascertain the reliability of the research test

instrument because there was little time for replications (i.e. data collection and data analysis) with other sample populations. With respect to internal validity, there were a greater number of responses that agreed with the intended answers than contradicted the intended answers. The question whether this might happen with more and larger sample populations is left unanswered, for future investigation. Another factor that may have affected the responses obtained in this investigation might be due to some kind of bias because of the technique of snowballing, where colleagues of the same cultural outlook may be an influencing factor. As an online questionnaire there is a greater opportunity of collecting electronic responses from larger sample populations which would be an added advantage so long as there are no restrictions on the time for data analysis.

In the next section, the fundamental issue of testability is discussed.

14.1 Testability of the Conceptual Frameworks

It was important to ascertain whether the conceptual models had testability, because it was understood from Popper (2002:95) that the weakness in a theory lies in the weakness of its testability. "Theories may be more or less severely testable ...The degree of their testability is significant for the selection of theories ... if the class of potential falsifiers of one theory is larger than that of another there will be more opportunities for the first theory to be refuted by experience, thus compared with the second theory, the first may be said to be falsifiable to a higher degree".

An awareness emerged in the research that it would be necessary to have other alternative models "up (its) sleeve" (Popper, 2002:67) to employ as potential falsifying hypotheses against the three Matrix Models, Model 1, Model 2 and Model 3. Beginning to imagine what they would be like a list of objections (i.e. possible potential falsifiers) was drawn up as follows:

Testing Model 1 (online teaching) –Possible Potential Falsifiers

1) Teaching has nothing to do with leadership.
2) Leadership does not play a role in online learning.
3) There is no such thing as a teacher in the Virtual Classroom.
4) Teachers do not need to do anything in the Virtual Classroom.
5) Teachers can do what they like as long as they keep out of a discussion group.

Testing Model 2 (online learning) –Possible Potential Falsifiers

1) There is no such thing as an online learner, online knowledge construction does not exist.
2) Online collaboration for learning does not work.
3) All online learners are the same – no need to differentiate between them.
4) Online learners can do what they like online.
5) It does not matter what the students learn or how they learn.

Testing Model 3 (*Pedagogical Variation*) –Possible Potential Falsifiers

1) Online teachers do not teach according to online student requirements.
2) There is no such thing as different pedagogies.
3) There is no need for a teacher to adjust their teaching for different groups.
4) E-learners do not learn better when the online teacher changes teaching strategies
5) There is only one kind of pedagogy that suits everyone.

These are just a few examples that could be looked for from critics.

In this part of the investigation, opportunities were sought to falsify the statements underpinning the conceptual Model 1 in Section A of the research test instrument. For example responses were prompted from the e-respondents regarding the kind of e-learners that might benefit from the four different e-moderator online behaviours, in anticipation of getting data reflecting the underlying assumptions of e-learner behaviours in Model 2. Section B of the research test instrument also prompted e-respondents to check how well the combinations of quadrants from Model 1 and Model 2 matched.

14.2 Effectiveness of the Hypothesis Testing Research Instrument

From the data recorded it was noticed that e-respondents were giving a number of shared insights, which were invaluable in the process of falsifiability. These shared insights prevented falsification, adding to mounting corroboration. The alternative viewpoints i.e. inconsistent data or possible potential falsifiers need careful scrutiny. Belson (1981:371) gives an explanation that "when a respondent finds it difficult to answer a question s/he is likely to modify it in such a way as to be able to answer it more easily" This is what may have happened where the responses show disagreement (Chapter Thirteen) with Quadrant, DH in Model 3.

An observation that can be made about the 'do not know' responses is well expressed by Belson (1981:373). Belson concludes that when a respondent "is unsure of all facts of the matter about which s/he is questioned s/he may limit themselves to that aspect of the matter about which s/he is questioned."

What became clear was that e-respondents seemed to depend on their own experience of online teaching and how they perceived their own students. In some cases responses suggested that the e-respondent found difficulty in capturing the underlying meaning of a question. An example of this uncertainty is shown in the following item of data giving an answer 'does not know' (Chapter Thirteen), *"I'm not sure about this. Maybe the e-learners are not collaborating because they feel uncomfortable with 'invisible others' in which case I would think the online teacher might want to encourage socialisation amongst the e-peers."*

Source: E-respondent's answer to Section B, Quadrant BF

Another example can be given here to show an alternative view point found in the data item giving 'doesn't matter' as a response (Chapter Thirteen) with regard to their own experience.*"I can't see that it matters. I have mature online students who are quite capable of finding things out on the Internet and tell others about what they have found. It's not up to me to be at their beck and call 24/7."*

Source: E-respondent's answer to Section B, Quadrant DH

It is noticed that e-respondents might 'widen a question' by their responses as shown in the data item selected below (Chapter Thirteen).*"A good match in many ways. Online teacher has the opportunity to give a lot of stimulating tasks and frequent feedback. The online students can feel 'safe' and that they are valued and welcomed online, especially the 'lurkers' and shirkers'."*

Source: E-respondent's answer to Section B, Quadrant CG (about e-learners who can cannot collaborate have difficulty in knowledge construction)

This way of responding is described by Benson (1981:377) that "under certain circumstances a term or concept may be widened". Benson (1981:377) concludes that "where the respondent feels s/he is too restricted by some very narrow concept the respondent may be saying too little by dwelling upon only a specific point of detail".

Reflecting on the alternative 'unexpected' responses from e-respondents there appears to be a reminder of what Popper (2002:96) concluded that a theory whose "empirical content is so great . . . there is, as it were little chance for it to escape falsification."

Indeed some responses refer to absence of body and feelings of discomfort of self-disclosure in an online community of invisible others. These counter explanations seem to focus on the online learning difficulties some e-learners experience with respect to invisibility of 'lurkers' and those that feel uncomfortable due to 'absence of physical presence'. These are an important feature in online learning and possibly could be seen to contradict the conceptual framework. It is argued that these are interesting points to make, but they would be seen by Popper (2002:96) as 'forbidden statements' in the conceptual framework because the basic statements of the conceptual framework underpin e-moderator behaviour with respect to

transactional and transformational behaviours and e-learner behaviour within the limits of collaborative capability and knowledge construction ability.

The next section deals with corroborability, which again is a test measure for describing a good conceptual framework. Falsifying a theoretical framework is a big job and the research may have oversimplified the matter, by using a single questionnaire with no other means of triangulating outcomes, other than the corroborative outcomes from e-moderator statements when developing the conceptual models (Chapter Twelve).

14.3 Degrees of Corroboration of the Outcomes

In order to assess the degree of corroborability of a theory, its degree of falsifiability is taken into consideration. The better testable a theory, the better it can be corroborated. For a theory to stand the test "its degree of corroboration will increase with the number of corroborating instances" (Popper, 2002:268). The next two sections 14.4 and 14.5, discuss interpretations of the outcomes of the Hypothesis Testing Research Instrument.

14.4 Summary: Outcomes for Section A of Test Instrument

This section reviews the data captured by the research instrument in Section A, for the four Quadrants A, B, C, and D in Model 1, prompting responses for the type of e-teaching that would benefit different kinds of e-learners. It was anticipated that e-respondents would interpret the questions as intended by giving expected or 'intended' responses (Benson, 1981:60) that would reflect the criteria of e-learning behaviour in Model 2.

In order to interpret how the e-respondents captured the underlying meanings of the questions, an examination was made, firstly, of (i) typical responses reflecting e-respondents' shared understandings which underpin the responses "within permissible limits of what was intended by the question" (Belson, 1981:350). Secondly an examination was made of (ii) alternative unexpected viewpoints for which Belson (1981:338) uses the term "speculative comments".

In the following sections I looked to see whether the data did or did not give supporting evidence in agreement with the concepts underpinning quadrants A, B, C, and D in Model 1 and quadrants E, F, G, and H in Model 2

14.4.1 Quadrant A

This section reviews the data captured by the research instrument in Section A,

for Quadrant A.

(i) Typical Responses reflecting shared understandings

Table 13.1 (Chapter Thirteen) identifies ten viewpoints that have a shared understanding with respect to the question where an online teacher offers little task-giving and little motivational

support. The intended response expected corroborates e-learner behaviour which is highly collaborative and highly effective in knowledge construction.(i.e. Quadrant E in Model 2). Those e-respondents (n=18) who captured the intended meaning of the question and who responded within permissible limits were also seen to have shared understandings of the situation.

The shared understandings found in these items (1-10), in Table 13.1, indicate sound evidence of corroboration for the basic statements underlying quadrants A and E in Model 1 and Model 2 respectively and Quadrant AE in Model 3.

(ii) Alternative Viewpoints

Table 13.2 (Chapter Thirteen) identifies three viewpoints that Belson (1981:338) would term speculative comments because the data from the e-respondents suggest an element of misinterpretation or misunderstanding. Item 11 indicates that an online tutor "might intervene at crisis moments." Does this mean that there is no tutor presence online at all where there are no crises? Item 12 gives a very disparaging view that in this situation the online teacher's behaviour "seems not to favour the 'group' – or indeed, learning". The interpretation here could be found to be speculative because there is an underlying assumption that the online teacher must be busy task-giving and providing a lot of motivational support. Taking a closer look at Item 13 there seems to be a suggestion that if online resource materials are available and e-learners are "following set learning materials" then "little input is required" from the online teacher "unless students require help"

Whilst these three speculative comments are at variance with the shared understandings, these could be considered as 'stray elements' as stated by Popper (2002:66) "A few stray basic statements contradicting a theory will hardly induce us to reject it as falsified. We shall take it as falsified only if we discover a reproducible effect which refutes the theory." Nevertheless, a more serious issue might be at stake with respect to the clarity of the wording in the online questionnaire itself as to whether the terminology using *few* tasks or *low* task-giving is sufficiently explicit and similarly the use of *little* motivational support. The occurrence of alternative viewpoints may then be due to the ambiguity of the wording in the question using the words few, low and little.

14.4.2 Quadrant B

This section reviews the data captured by the research instrument in Section A, for Quadrant B in Model 1.

(i) Typical Responses reflecting shared understandings

Table 13.3 (Chapter Thirteen) identifies ten viewpoints that have a shared understanding with respect to the question where an online teacher offers a lot of task-giving and little

motivational support. The intended response expected corroborates e-learner behaviour which is characterised by little or no collaboration with much knowledge construction, (i.e. Quadrant F in Model 2). Those e-respondents (n=17) who captured the intended meaning of the question and who responded within permissible limits were also seen to have shared understandings of the situation. This is exemplified by Item 49, i.e. *"These students are actively engaged in numerous online activities; but are unable to collaborate with each other because of egocentric approach to study."* Source: Chapter Thirteen-respondent R16, Item 49.

The shared understandings found in these items (43-52), in Table 13.3, indicate sound evidence of corroboration for the basic statements underlying quadrants B and F in Model 1 and Model 2 respectively and quadrant BF in Model 3.

(ii) Alternative Viewpoints

Table 13.4 (Chapter Thirteen) identifies four viewpoints that Belson (1981:338) would term speculative comments, relating to the online teacher's failure to provide regular feedback. Item 55 is an example of this line of thought: *"The e-learning group might be 'seduced' by the online simulations, requesting more to be given to them online, but do not need feedback from the online teacher because the software provides this automatically."* Source: Chapter Thirteen, e-respondent R14, Item 55.

There is an interesting stray point made about the way in which "the software provides this (*feedback*) automatically" which seems to hint what Garrison and Anderson (2003:47) foresee in future e-learning developments. That is, the software "allows each student to create an agent that negotiates with other agents to facilitate one-to-one tutoring and response to individual questions by available students at any time, located anywhere on the Internet. We expect more such agent tools to evolve in the next decade." The five alternative viewpoints (items 51 – 56, Table 13.4) were not regarded as posing any serious threat in falsifying the basic statements underlying quadrants B and F in Model 1 and Model 2 respectively and Quadrant BF in Model 3. They may however suggest possible potential falsification if made repeatedly in a larger sample population. From another aspect, however, the research instrument may have a flaw with respect to the non-explicit, taken-for-granted nature of the wording *little* motivational support and *a lot* of task-giving.

The next section examines the data for Quadrant C.

14.4.3 Quadrant C

This section reviews the data captured by the research instrument in Section A, for Quadrant C.

(i) Typical Responses reflecting shared understandings

Table 13.5 (Chapter Thirteen) identifies ten viewpoints that have a shared understanding with respect to the question where an online teacher offers lots of task-giving and much motivational support. The intended response expected corroborates e-learner behaviour which is non- collaborative with little knowledge construction, (i.e. Quadrant G in Model 2). Those e-respondents (n=16) who captured the intended meaning of the question and who responded within permissible limits were also seen to have shared understandings of the situation. This is exemplified by Item 28, i.e. *"A group needing quite a lot of pushing and direction to get going. Lots of tasks provide something concrete for the group to get into. Support needed to push group into thinking they can achieve these tasks."* Source: Chapter Thirteen, e-respondent R03, Item 28.

The shared understandings found in these items (28-37, Table 13.5) indicate sound evidence of corroboration for the basic statements underlying quadrants C and G in Model 1 and Model 2 respectively and Quadrant CG in Model 3.

(ii) Alternative Viewpoints

Table 13.6 (Chapter Thirteen) identifies five viewpoints that Belson (1981:338) would term "speculative comments". Item 38 is a good example of a speculative comment or on the other hand which could be recognised as a falsifier, .i.e. *"Maybe these students have problems ,with absence of body in communicating"* ,Source: Chapter Thirteen, e-respondent R01, Item 38

Two other items (39 and 42) signal "a sense of isolation due to invisible others" and another two items (40 and 41) refer to feeling "uncomfortable with self-disclosure" and needing support "in developing online learning skills, especially in the use of the hardware and software." respectively.

The five alternative viewpoints (items 38 – 42, Table 13.6) were not seen to pose any threat in falsifying the basic statements underlying quadrants C and G in Model 1 and Model 2 respectively and Quadrant CG in Model 3. However these viewpoints do indicate the potential of falsification. From these outcomes doubt could be thrown on the wording of the hypothesis testing research instrument that does not explicitly describe what is meant by the terms used as a *lot* of task-giving and a *lot* of motivational support.

14.4.4 Quadrant D

This section reviews the data captured by the research instrument in Section A, for Quadrant D.

(i) Typical Responses reflecting shared understandings

Table 13.7 (Chapter Thirteen) identifies ten viewpoints that have a shared understanding with respect to the question where an online teacher offers little task-giving and much motivational support. The intended response expected corroborates e-learner behaviour which is highly collaborative with little knowledge construction, (i.e. Quadrant H in Model 2). Those e-respondents (n=17) who captured the intended meaning of the question and who responded within permissible limits were also seen to have shared understandings of the situation. This is exemplified by Item 18: *"This would apply to e-learners who are willing to support each other but are struggling with the work and need a lot of encouragement (motivation) to boost their self-confidence. They would only be able to cope with a few tasks at a time."*
Source: Chapter Thirteen, e-respondent R09, Item 18,

The shared understandings found in these items (14-23, Table 13.7) indicate sound evidence of corroboration for the basic statements underlying Quadrant D and Quadrant H in Model 1 and Model 2 respectively and Quadrant DH in Model 3.

(ii) Alternative Viewpoints

Table 13.8 (Chapter Thirteen) identifies four viewpoints that Belson (1981:338) would term speculative comments. Item 24 is a good example of this: *"This might be in the context of students providing self-reflective content online (such as personal diaries) or who are conducting collaborative research, such as producing Wiki content on self-selected themes"*
Source: Chapter 13, e-respondent R05, Item 24,

When examining the other three items, Item 25, Item 26 and Item 27, it seems that the e-respondents in each case may have misinterpreted the question. They each give a reason why the teacher is not giving tasks i.e. students more familiar with a topic, group discussion requested by students, and student is driving content. These reasons reflect their possible misunderstanding of the situation (i.e. that it is due to task-difficulty that teacher prefers to give fewer tasks.)

These outcomes raise a question as to whether the respondents failed to understand what the question was getting at due to the ambiguity of the wording in the question. This would need further investigation, particularly in revising the questionnaire by giving specific definitions for task-giving and explicit statements for a lot or a few tasks. What might be taken as a few for one respondent may be considered a lot for another respondent and vice versa.

These alternative viewpoints might be regarded as possible potential falsifiers, in the conceptual model for Quadrant D in Model 1, Quadrant H in Model 2 and Quadrant DH in Model 3.

14.5 Interpretation of the Outcomes for Section B of Test Instrument Matching Process

In the previous chapter, Chapter Thirteen, a listing of the data for each of the four categories, good fit, bad fit, doesn't matter and don't know, for each of the four quadrants AE, DH, CG and BF, was made. To find out how e-respondents agreed or not with the conceptual *Pedagogical Variation* model, the list starts with reasons for good fit, then bad fit followed by doesn't matter and lastly don't know, in the same order as presented in Section B of the Hypothesis Testing Research Instrument. In this section, interpretations of the outcomes are given in the same order as in Chapter Thirteen.

(i) Good fit

An overall percentage of 81% of e-respondents expressed that the matching of all four quadrants gave a good fit Chapter 13. Interpretations for each of the matching quadrants (A and E, B and F, C and G, D and H) are given in the following sections.

(p) For AE

E-responses for this quadrant (n=17) gave an overall percentage of 81% as 'good fit' shown in Bar Chart, Graph 13.2 (Chapter Thirteen). The typical statements which underpinned shared understandings reflect how e-moderator research participants agreed with the notion of giving few tasks and little motivational support where e-learners have high collaborative capability and high levels of knowledge construction.

This outcome can be compared with the way in which e-moderator statements provided supporting evidence for Quadrant AE (Chapter Twelve). When comparing the percentage composition of the four quadrants in Model 3 (corroborated by statements in the first empirical study using personal construct psychology), AE=24% (Chapter Twelve) and came third in ranking order. When comparing the percentage composition of the four quadrants in Model 3 (corroborated by e-responses from the Hypothesis Testing Research Instrument), AE=25% (Doughnut Chart, Graph13.3) and came third in ranking order (Section 13.4). The results of triangulating data from the first empirical study, and the second empirical study, are tabulated in Table 14.1 below.

Table 14.1 Triangulating Data from Empirical Studies 1 and 2 for Quadrant AE

Quadrant	Data from Statements Personal construct psychology elicitation Empirical Study 1		Data from Hypothesis Testing Research Instrument Empirical Study 2	
AE	% Composition In Model 3	Position in Rank Order	% Composition In Model 3	Position in Rank Order
	24%	3	25%	3

The above results indicate that the data from both empirical studies produce the same ranking order for Quadrant AE when compared to the other three quadrants (BF, CG and DH). The comparison of the percentage composition of Quadrant AE in Model 3 shows a difference of 1%, there being slightly more evidence of agreement using the Hypothesis Testing Research Instrument. This interpretation of the results for the agreement of good fit for Quadrants A and E means that e-moderator participants in both the empirical investigations (i) using personal concept psychology (ii) hypothesis testing instrument, sample populations have a shared understanding of the conceptual framework for this Quadrant.

(q) For DH

The result of good fit for this quadrant was recorded as the lowest out of the four quadrants. E-responses for this quadrant (n=13) gave an overall percentage of 62% as a good fit, shown in Bar Chart, Graph 13.2 (Chapter Thirteen).The typical statements which underpinned shared understandings reflect how e-moderator research participants agreed with the notion of giving few tasks and a lot of motivational support where e-learners have high collaborative capability and low levels of knowledge construction. This outcome can be compared with the way in which e-moderator statements provided supporting evidence for Quadrant DH (Chapter Twelve, Section 12.4 and Chapter Thirteen, Section 13.3). When comparing the percentage composition of the four quadrants in Model 3 (corroborated by statements), DH=19% (Pie Chart, Graph 12.3 and Table 14.5) and came fourth in ranking order. When comparing the percentage composition of the four quadrants in Model 3 (corroborated by e-responses from the Hypothesis Testing Research Instrument), DH=19% (Doughnut Chart, Graph 13.3) and came fourth in ranking order (Section 13.4). The results of triangulating data from Empirical Study 1 and Empirical Study 2 are tabulated in Table 14.2 below.

Table 14.2 Triangulating Data Empirical Studies 1 and 2 for Quadrant DH

Quadrant	Data from Statements Empirical Study 1		Data from Hypothesis Testing Research Instrument Empirical Study 2	
DH	% Composition In Model 3	Position in Rank Order	% Composition In Model 3	Position in Rank Order
	19%	4	19%	4

The above results indicate that the data from both empirical studies produce the same ranking order for Quadrant DH when compared to the other three quadrants, (AE, BF and CG). The comparison of the percentage composition of Quadrant DH in Model 3 shows no difference in the evidence of agreement using the Hypothesis Testing Research Instrument in Empirical Study 2 or methodology of personal construct psychology to elicit e-moderator perceptions of their online roles in Empirical Study 1. This interpretation of the results for the agreement of good fit for Quadrants D and H means that e-moderator participants in both Empirical Study 1 and Empirical Study 2 sample populations have a shared understanding of the conceptual framework for this Quadrant.

(r) For CG

This match is the most favoured. The majority of e-responses for this quadrant (n=20) gave an overall percentage of 95% as a good fit, shown in Bar Chart, Graph 13.2 (Chapter Thirteen, Section 13.4).The typical statements which underpinned shared understandings reflect how e-moderator research participants agreed with the notion of giving many tasks and a lot of motivational support where e-learners have low collaborative capability and low levels of knowledge construction. This outcome can be compared with the way in which e-moderator statements provided supporting evidence for Quadrant CG (Chapter Twelve, Section 12.7). When comparing the percentage composition of the four quadrants in Model 3 (corroborated by statements), CG=30% (Pie Chart, Graph 12.3) and came first in ranking order. When comparing the percentage composition of the four quadrants in Model 3 (corroborated by e-responses from the Hypothesis Testing Research Instrument), CG=29% (Doughnut Chart, Graph 13.3) and came first in ranking order (Section 13.4). The results of triangulating data from Empirical Study 1 and Empirical Study 2 are tabulated in Table 14.3 below.

Table 14.3 Triangulating Data from Empirical Studies 1 and 2 for Quadrant CG

Quadrant	Data from Statements Empirical Study 1		Data from Hypothesis Testing Research Instrument Empirical Study 2	
CG	% Composition In Model 3	Position in Rank Order	% Composition In Model 3	Position in Rank Order
	30%	1	29%	1

The above results indicate that the data from both empirical studies produce the same ranking order for Quadrant CG when compared to the other three quadrants, (AE, BF and DH). The comparison of the percentage composition of Quadrant CG in Model 3 shows a difference of 1%, there being slightly more evidence of agreement using the methodology of personal construct psychology to elicit e-moderator statements about perceptions of their online roles in Empirical Study 1. This interpretation of the results for the agreement of good fit for Quadrants C and G means that e-moderator participants in both Empirical Study 1 and Empirical Study 2 sample populations have a shared understanding of the conceptual framework for this Quadrant.

(d) For BF

The majority of e-responses for this quadrant (n=18) gave an overall percentage of 86% as good fit as a good fit, as shown in Bar Chart, Graph 13.2 (Chapter Thirteen, Section 13.4).The typical statements which underpinned shared understandings reflect how e-moderator research participants agreed with the notion of giving many tasks and a little motivational support where e-learners have low collaborative capability and high levels of knowledge construction. This outcome can be compared with the way in which e-moderator statements provided supporting evidence for Quadrant BF (Chapter Twelve, Section 12.4). When comparing the percentage composition of the four quadrants in Model 3 (corroborated by verbatim statements), BF=27% (Pie Chart, Graph 12.3) and came second in ranking order. When comparing the percentage composition of the four quadrants in Model 3 (corroborated by e-responses from the Hypothesis Testing Research Instrument), BF=27% (Doughnut Chart, Graph 13.3) and came second in ranking order (Section 13.4). The results of triangulating data from Empirical Study 1 and Empirical Study 2 are tabulated in Table 14.4 below.

Table 14.4 Triangulating Data from Empirical Studies 1 and 2 for Quadrant BF

Quadrant	Data from Statements Empirical Study 1		Data from Hypothesis Testing Research Instrument Empirical Study 2	
BF	% Composition In Model 3	Position in Rank Order	% Composition In Model 3	Position in Rank Order
	27%	2	27%	2

The above results indicate that the data from both empirical studies produce the same ranking order for Quadrant BF when compared to the other three quadrants, (AE, CG and DH). The comparison of the percentage composition of Quadrant BF in Model 3 shows no difference in the evidence of agreement using the Hypothesis Testing Research Instrument in Empirical Study 2 or methodology of personal construct psychology to elicit statements about e-moderator perceptions of their online roles in the first empirical study adapting personal construct psychology.

This interpretation of the results for the agreement of good fit for Quadrants B and F means that e-moderator participants in both Empirical Study 1 and Empirical Study 2 sample populations have a shared understanding of the conceptual framework for this Quadrant.

Having shown how the collection of data from Empirical Study 1 and Empirical Study 2 was used to triangulate outcomes for the notion of good fit of four quadrants in the *Pedagogical Variation* model, in this section, the next section shows how the notion of bad fit was evidenced.

(ii) Bad fit

(e) For AE

None reported.

(f) For DH

This is the only quadrant in Model 3 where e-respondents found difficulty in agreeing with the underlying assumptions for this quadrant. Bar Chart, Graph 13.1 (Chapter Thirteen, Section 13.3) shows the 14% of e-respondents (n=3) who stated that they felt Quadrant DH was a bad fit. In Section 14.2 above and in Chapter Thirteen, Section 13.4.1, explanations are given as to why Quadrants D and H were seen to be a bad fit. The three reason from e-respondents indicated rival explanations with respect to analysing tasks as difficult or easy rather than looking at the task-giving variable using tasks of the same level of difficulty but varying in amount (quantity) provided by an online teacher. For example if there are five tasks of the same level of difficulty to be given to online learners in a week, then e-learners

with little knowledge construction ability would be given fewer at a time (i.e. tasks would be spaced out in the week). These tasks would be accompanied by a high degree of motivational support (i.e. scaffolding) in contrast to e-learners in Quadrant BF who have high knowledge construction ability and would be able to cope with more than one task at a time due to their sense of their independent self-directed learning.

(g) For CG and BF

None to report.

(iii) Doesn't matter

(i) For AE

14% of e-respondents (n=3) reported that it does not matter what happens in this situation. Their reasons were similar in the sense that e-respondents felt that in a constructivist environment it wouldn't matter of the online teacher intervened or not because e-peers are collaborating together, trusting each other and sharing ideas.

(j) For DH

9.5% e-respondents (n=2) reported that it does not matter what happens in this situation when online learners have difficulty in knowledge construction. These two e-moderators felt that their online learners, as adults would be finding things out from each other anyway and that their Internet skills were sufficiently good to find things out for themselves. A point was raised by one of the e-respondents regarding their online presence, being aware that some e-learners may expect them to be online 24/7. This is a valid universal point. This remark would be relevant to all the four quadrants, but seems to stray from the rationale of task-giving and motivational support within a reasonable time-frame negotiated with the e-learning community.

(k) For CG

None to report.

(l) For BF

4.7% e-respondents (n=1) who reported that it does not matter what happens in this situation. Their reason implies that non-collaborative, independent self-directed e-learners would get on with their work with or without an online teacher.

(iii) Don't know

All four quadrants had responses returned as don't know. Quadrant DH had the greatest number of responses (n-3) in this category, followed by BF (n=2) and AE and CG both had n=1.

(m) For AE

4.7% e-respondents (n=1) who reported that they didn't know what kind of a match Quadrants A and E were. Their reason implied that they had not had the experience of students who had a high level of collaboration and a high level of knowledge construction.

(n) For DH

14.3 % respondents (n=3) reported that they didn't know what happens in this situation. Three very different reasons were given for these responses. Quadrant DH is the one which has the most don't know responses. There seems to be a problem in the notion of *little* task-giving. This was pointed out in one of the responses in the sense that the response indicated that if the tasks were easy then a *lot of tasks rather than a few* would be a better way of helping online students who are struggling. This is an instance where there arises an ambiguity in the wording of the question. The Hypothesis Testing Research Instrument needs to be more explicit in what is to be understood by *a little* or *low* task-giving. The alternative suggestion given in the e-response may contribute to a possible potential falsifier for the conceptual framework underpinning this Quadrant of the Model for *Pedagogical Variation*. One e-respondent responded from their experience of not knowing how to decide what kind of match Quadrants D and H are due to their inexperience of having a group of e-learners who were struggling with their online course. Another different viewpoint was presented in the sense that it would be a difficult choice to make if some on the course were struggling and others were not.

The point that should be made here is that the underlying assumption is that all the e-learners belonging to Quadrant DH are struggling with unfamiliar course content or tasks.

(o) For CG

4.7% e-respondents (n=1) reported that they didn't know what happens in this situation. This e-response seems to indicate that the e-moderator has not had the experience of lurkers and shirkers and therefore is uneasy about answering this question..

(p) For BF

9.5% e-respondents (n=2) reported that they didn't know what happens in this situation. Two similar reasons were given for this choice of answer. It was assumed by the e-respondents that the non-collaboration of the e-learners in this Quadrant should be

addressed rather than to accept the fact that some e-learners prefer to work on their own without sharing ideas with other.

This is the last comment to be recorded in this Section 14.5. The next chapter, Chapter Fifteen, examines the limitations of Empirical Study 2 and discusses opportunities for further research. Section 14.6 below summarises the interpretation of the outcomes using the online Hypothesis Testing Research Instrument and triangulates results with the data collected from e-moderator statements in Empirical Study 1.

14.6 Summary

This chapter has explained interpretations of the outcomes described in the previous chapter, Chapter Thirteen. These outcomes proved to be invaluable for the interpretation of their relationship to the conceptual design for Model 1 (quadrants A, B, C, and D) and for Model 2 (quadrants D, E, F, and G) and for Model 3 (quadrants AE, BF, CG, and DH). There was an opportunity to use Popper's (2002:268) criteria for (i) testability (ii) falsifiability and (iii) corroborability to gain greater insight to the way in which the three hypothetical models were construed.

The evidence from the outcomes of the Hypothesis Testing Research Instrument (i.e. the online questionnaire) proved to be useful in identifying shared insights that e-respondents gave together with alternative viewpoints. These different perspectives had no serious threat on the falsification by any kind of high degree of persistent plausible rival statements for any of the three conceptual frameworks for Model 1, Model 2 or Model 3. However, while there appears to be no serious threat by alternative plausible explanations to any great degree, it is important to understand that the alternative viewpoints might become more identifiable in larger and culturally different sample populations. The alternative viewpoints also highlighted weaknesses in the wording of the questionnaire which in turn throw light on the essential clarity in wording the four assumptions underpinning the four quadrants in the conceptual *Pedagogical Variation* model.

To conclude the interpretations of the outcomes on a positive note, the triangulation of Empirical Study 1 data and Empirical Study 2 data for the good fit of the four quadrants in the table is summarised below in Table 14.5.

Table 14.5 Triangulating Data from Empirical Studies 1 and 2 for Quadrants CG, BF, AE and DH in Rank Order

Quadrant	Data from Statements Empirical Study 1		Data from Hypothesis Testing Research Instrument Empirical Study 2	
	% Composition In Model 3	Rank Order	% Composition In Model 3	Rank Order
CG	30%	1	29%	1
BF	27%	2	27%	2
AE	24%	3	25%	3
DH	19%	4	19%	4

The above table shows the aggregate of outcomes from both Empirical Study 1 and Empirical Study 2 data which provide supporting evidence for the conceptualization of Model 3 for *Pedagogical Variation.* The research results show that corroboration from results (Empirical Study1 and Empirical Study 2) indicate that the hypothetical *Pedagogical Variation* model has withstood open scrutiny. This, however cannot be confirmed until further tests are made with larger sample populations and possible modification of techniques for data collection procedures. This opens scope for future research studies.

Chapter Fifteen

CONCLUSION

What can the research claim?

15.0 Introduction

Babbie (2004:123) states that "*...Whenever we take our concepts seriously and set about specifying what we mean by them, we discover disagreement and inconsistencies ...each of us is likely to find a good deal of muddiness within our own mental images.*"

In this thesis, there is much discussion and explaining about the conceptual design for the *Pedagogical Variation* model in previous chapters, which is why the above quote is helpful. It reassures, but also suggests that disagreement and inconsistencies may be integral to the text and argument. Testing the *Pedagogical Variation* Model (Chapter Thirteen) was a crucial stage in this investigation. Suppose the research instrument did not measure what it was supposed to measure? And what if it did measure what it was supposed to measure and the outcomes falsified the factors underpinning the conceptual framework: would the research be doomed to failure? Here lies a very basic assumption; that the researcher accepts whatever the outcomes of plausible explanations when faced with rival explanations.

The distinction between falsifiability and falsification (Popper, 2002:66) emerged in the investigation where these two terms were properly put into practice. Popper's explanation (2002:66) regarding falsifiability was used as a criterion "for the empirical character of a system of statements", and for falsification "special rules must be introduced which will determine under what conditions a system is to be regarded as falsified". This rigorous method of testing a hypothesis acted as a springboard to discuss how the research instrument was designed to allow for freedom of falsification when applied to the conceptual framework for online teaching and learning. The conceptual *Pedagogical Variation* model does allow for the implementation of a practical empirical test to be made to identify whether there are grounds for falsification. To this end, the design of a research instrument for testing the hypothesis is discussed in the next section.

A further question that arises, in reflecting on the design of the investigative tool was whether there would be certain levels of falsification that should be taken into account. Popper (2002:32) provides methodological rules as conventions. One of these rules states that once a proposed hypothesis has "proved its mettle" after being tested there has to be a sound justification for its replacement by another which is "better testable". Now, another question arises as to what is meant by "sound justification"? Again, Popper (2002:67) provides an answer. If there is a single, non-reproducible contradictory statement it is of no consequence. Popper (2002:66) concludes that "a few stray basic statements contradicting a theory will hardly induce us to reject it as falsified . . . we only accept the falsification if a low-level empirical hypothesis which describes such an effect (a reproducible contradiction) is proposed and corroborated. This kind of hypothesis may be called a falsifying hypothesis."

This insight shaped the design of a research instrument which explicitly identified the basic statements underpinning the *Pedagogical Variation* model, as a fair test, thereby exposing them to critical scrutiny.

15.1 What makes for a good conceptual framework?

Popper (2002: 280) states that "*bold ideas, unjustified anticipations, and speculative thoughts, are our only means for interpreting nature; our only organ, our only instrument for grasping her. And we must hazard them to win our prize. Those among us who are unwilling to expose their ideas to the hazard of refutation do not take part in the scientific game. . .*"

In Chapter Four, a variety of conceptual frameworks for the pedagogy of online learning and teaching were explored. These, no doubt, began as the sort of 'bold ideas, unjustified anticipations and speculative thoughts', discussed by Popper above. They, in turn, had to be worked on to become clearer and more understandable, by the process of conceptualisation described by Babbie (2004-G2). He states that conceptualisation is a "mental process whereby fuzzy and imprecise notions (concepts) are made more specific and precise". Berg (2004:29) also provides useful advice on how to communicate a concept, to make sure "that everyone is working with the same definition and mental image". Berg emphasises that as a researcher you ". . . begin by declaring a term to mean

whatever you want it to mean". This is an important stage for a research design. Whether other researchers agree or disagree with a term or assumption is beside the point, so long as the concept is understood clearly for others to make their own assessment about it.

After the conceptualisation of the three models, specific variables and constructs were operationalized by designing several coding templates (Empirical Study 1, Appendices B4 and B5). As Babbie (2004-G7) defined in his glossary, operationalization is a "step beyond conceptualisation . . . (it) is the process of developing operational definitions or specifying the exact operations involved in measuring a variable". Great care was taken to define all the terms and variables in the research design (Chapter Fourteen) because if this had not been done, it would have been difficult to explain, in a meaningful way, how the three models represent a conceptual model for *Pedagogical Variation* applicable to online teaching and learning (Berg, 2004:31).

In Chapters Eight and Twelve, a descriptive narrative and explanations were given to map the ways in which data from e-moderator statements regarding their perceptions of their online roles and relationships were used to corroborate the three hypothetical models. In the next three sections these hypothetical models are briefly reviewed before discussing initial thoughts about evaluating the final, third model based on an original paradigm for *Pedagogical Variation* when merging the first two conceptual models.

15.2 Examining Conceptualisation of a Hypothetical Model based on e-moderator perceptions of what they do online

In the conceptualisation of bringing two e-moderator online behaviours like 'task-giving' and 'motivational support' together into a matrix framework, it was possible to show how these two independent variables could co-exist together in varying degrees, i.e. from a low construct to a high construct for each of the two variables. This resulted in the creation of Matrix Model 1 for *Pedagogical Variation* based on e-moderator perceptions of what they do online (Chapter Six). The four quadrants A, B, C and D are each characterised by constructs indicating the degree of task-giving and the degree of motivational support, i.e. construct for high degree or construct for low degree. That is to say that a test instrument should be capable of identifying each construct for each variable.

During the corroborative phase in the development of Matrix Model 1, 72 statements, each containing a pair of constructs provided the greatest amount of evidence, for Quadrant C

(i.e.30 statements). When placed in rank order based on the number of corroborative statements, Quadrant C came first and then in descending order followed by quadrants B, A and D respectively, as shown in a Bar Chart (Chapter Thirteen). On examining the first two quadrants, C and B, it can be noticed that both these quadrants are each characterised by the high task-giving transactional construct, whether with high motivational support as in Quadrant C or with low motivational support as in Quadrant B. The data revealed that e-moderator high task-giving construct was found to be more evident than the low task-giving construct.

Whether this pattern reflects e-moderator perceptions of a lot of task-giving, i.e. transactional behaviour, as a significant part of their online role, suggests opportunities for further investigation. There was also the greatest amount of evidence, from the number of corroborative statements based on e-moderator perceptions, of a high motivational transformational construct linked to high transactional task-giving behaviour (i.e. Quadrant C).

When comparing quadrants A and D, more corroborative evidence was found for Quadrant A than for Quadrant D. Quadrant A is characterised by both low constructs for transactional behaviour (task-giving) and transformational behaviour (motivational support). The question whether this pattern of behaviour is more recognisable in online teaching than less transactional behaviour with a greater degree of transformational behaviour (i.e. as shown in Quadrant D) provides opportunities for further research. The least evidence was found for Quadrant D, characterised by a low task-giving transactional construct and high motivational support, transformational construct. Further investigation to find out why this is so may reveal more about the nature of teaching and learning in virtual classrooms.

Table 15.1 below shows the distribution of the four constructs F1, F2, F3 and F4 in the respective quadrants A, B, C and D. The data used comes from Figure 12.1, Empirical Study 1, Chapter 12.

Table 15.1 Distribution of the four constructs in Model 1 Quadrants

Item	Construct	Quad.	Freq.	Totals		%
1	F1 Low task-giving	A	14			
		D	10			
			Total=	**24**	F1	16.7
2	F2 High task-giving	B	18			
		C	30			
			Total=	**48**	F2	33.3
3	F3 Low motivational support	A	14			
		B	18			
			Total=	**32**	F3	22.2
4	F4 High motivational support	C	30			
		D	10			
			Total=	**40**	F4	27.8
		TOTAL		**144**	constructs	100%

From the data recorded in Table 15.1 another table, Table 15.2 was drawn up giving the rank order of the aggregate total of each of the four constructs in Model 1. That is to say a total of F1 construct (in quadrants A and D), F2 construct (in quadrants B and C), F3 construct (in quadrants A and B), and F4 (in quadrants C and D), were ranked in descending order. The results of this process are shown in Table 15.2 below.

Table 15.2 Rank Order of the four constructs in Model 1 Quadrants

Construct	Freq.	%	Description of construct	Description of Behaviour	
				Transactional	Transformational
F2	48	33.3	High task-giving	√	
F4	40	27.8	High motivational support		√
F3	32	22.2	Low motivational support		√
F1	24	16.7	Low task-giving	√	
Totals	144	100			

From the above table it is evident that the aggregate frequency for high task-giving, recorded 48 times gave the highest percentage (33.3%) and low task-giving recorded 24

times gave the lowest percentage (16.7%) in Model 1. There was a 5.5% difference between high task-giving and high motivational support which seems to suggest that e-moderators recognise both these characteristics as important factors in their online teaching roles. In the next section, the characteristics of Matrix Model 2 are discussed.

15.3 Examining Conceptualisation of a Hypothetical Model based on e-moderator perceptions of what e-learners are able to do online

In the conceptualisations of bringing two e-learner online behaviours like collaborative capability and knowledge construction ability together into a matrix framework it was possible to show how these two independent variables could co-exist together in varying degrees, i.e. from a high construct to a low construct for each of the two variables. This resulted in the creation of Matrix Model 2 for *Pedagogical Variation* based on e-moderator perceptions of what e-learners are able to do online as shown in Figure 12.2 (Empirical Study 1, Chapter 12). During the corroborative phase in the development of Matrix Model 2, 76 statements, each containing a pair of constructs, were used.

The four quadrants D, E, F and G are each characterised by constructs indicating the degree of collaborative capability and knowledge construction ability, i.e. construct for high degree or construct for low degree. That is to say that a test instrument should be capable of identifying each construct for each variable.

Table 15.3 Distribution of the four constructs in Model 2 Quadrants

Item	Construct	Quad.	Freq.	Totals		%
1	F5	E	16			
		H	14			
			Total=	**30**	F1	19.7
2	F6	F	20			
		G	26			
			Total=	**46**	F2	30.3
3	F7	E	16			
		F	20			
			Total=	**36**	F3	23.7
4	F8	G	26			
		H	14			
			Total=	**40**	F4	26.3
		TOTAL		**152**	constructs	100%

From the data recorded in Table 15.3 another table, Table 15.4 was drawn up giving the rank order of the aggregate total of each of the four constructs in Model 2. That is to say a total of F5 construct (in quadrants E and H), F6 construct (in quadrants F and G) F7 construct (in quadrants E and F), and F8 (in quadrants G and H), were ranked in descending order. The results of this process are shown in Table 15.4 below.

Table 15.4 Rank Order of the four constructs in Model 2 Quadrants

Construct	Freq.	%	Description of construct
F6	46	30.3	Low Collaborative Capability
F8	40	26.3	Low Knowledge Construction
F7	36	23.7	High Knowledge Construction
F5	30	19.7	High Collaborative Capability
Totals	152	100	

From the above table it is evident that the aggregate frequency for low collaborative capability, recorded 46 times gave the highest percentage (30.3%) and high collaborative capability recorded 30 times gave the lowest percentage (19.7%) in Model 2. There was a 10.6% difference between low collaborative capability and high collaborative capability.

From the above table it is evident that the aggregate frequency for low knowledge construction ability, recorded 40 times gave the second highest percentage (26.3%) and high knowledge construction ability recorded 36 times gave the second lowest percentage (23.7%) in Model 2. There was a 2.6% difference between low knowledge construction ability and high knowledge construction ability. The tabulations, Table 15.2 and Table 15.4 which indicate the rank order of constructs provide insight to the degree of corroboration to be expected in Model 3 where the two Models 1 and 2 are merged. That is to say that high task-giving and high motivational support are the first two constructs in rank order for Model 1 and low collaborative ability and low knowledge construction are the first two constructs in rank order for Model 2

15.4 Examining Conceptualisation of a Hypothetical Model based on e-moderator perceptions of what they do and what e-learners are able to do online (Merging Hypothetical Models 1 and 2)

The conceptual framework for this final model (Model 3) is discussed in Chapter Six. It is included in this chapter, briefly, because this is the model that had been evaluated in Empirical Study 2. Again from the data of 99 statements (Empirical Study 1, Chapter Twelve) it was possible to corroborate all of the four quadrants to some extent, i.e. the following Table 15.5 shows the number of statements which matched the coding templates for each of the four categories in Model 3.This is a useful tabulation because it can be used to compare the results of the outcomes from the Hypothesis Testing Research Instrument.

Table 15.5 Rank Order of the four Quadrants in Model 3

Rank Order	Quadrant	Frequency Verbatim Statements	% Composition
1	CG	24	30
2	BF	27	27
3	AE	29	24
4	DH	19	19
	Total	99	100

The first in rank order, Quadrant CG is characterised by the four constructs (i) high task-giving (ii) high motivational support (iii) low collaborative capability and (iv) low knowledge construction. These four constructs were found to rank in the two top most positions in Model 1 (Table 15.2) and Model 2 (Table 15.4) respectively. I begin the next section by discussing the rationale underpinning the evaluation process.

15.5 Reviewing the rationale for the study

In this investigation, it was realised that an inductive methodology might have been applicable and/or a deductive approach to evaluate the final conceptual Model 3 in which e-moderator perceptions of what they do online are matched to e-moderator perceptions of what e-learners are able to do online. When reflecting on the early stages of the research, it might have seemed to be a risky business to test a conceptual framework where the possibility of merging Model 1 with Model 2 to create Model 3 was tentatively explored. The resulting hypothetical model, (Model 3) for *Pedagogical Variation* incorporated both instructivist and constructivist paradigms. This is very different from Salmon's (2011) five-stage model which had become, at the time, the theoretical basis for e-moderator training in a number of UK universities. At the same time, much of the research literature focussed on e-moderator task-giving e-tivities and strategies for developing an online role

as a "guide on the side" by which e- moderators would create and sustain a constructivist learning environment. The development of e-tivities by an instructor may be viewed to be a loosely interpreted constructivist approach, because of a teacher-led design and delivery process (Gulati, 2004). It was difficult to resist calling this viewpoint into question with a critical eye, because here we have a so-called constructivist learning environment surreptitiously underpinned by instructivist principles.

In contrast a strictly constructivist approach is underpinned by a very different assumption where online learners enjoy the freedom to generate, develop and solve, amongst themselves in a learning community, their own problem-solving tasks. However, it was possible to overcome such 'blindness'. Much of the research literature advocates that online learning fosters a high degree of collaboration and knowledge construction, characteristic of a constructivist environment. But in the researcher's experience of online learning this was not the case. Many of the e-peers felt isolated, in absence of body (Stone, 1991) and intimidated by the thought of having all their postings archived for future reference, in the event that they may have made some irrelevant or off-the-mark comments they had inadvertently made, which they would not like to expose to public view. If at any time e-peers were to reflect on their personal insights which did not attract positive responses, from e-peers or the e-moderator, then they might have refrained from participating. The e-moderator would then have sent personal emails to coax them back online. Such was the dilemma. Indeed the drop-out rate was something to be reckoned with if online learning were to become effective for *all* students. It was these insights that engaged the researcher to re-think what kind of pedagogy would attract those who were uncomfortable in a constructivist learning environment.

By encountering Grow (1991) there was the recognition that what he had found with respect to self-directed learning was in some way connected to the researcher's line of thinking. He had borrowed several key ideas from a situational leadership model (Hersey and Blanchard, 1988). An effective management or teaching style is one that matches a person's readiness, i.e. the combination of differing ability and differing motivation. That is to say from not being able to being able and unwilling to willing to do a specific task (Grow, 1991:126)

Again the researcher's thoughts relating to the conceptual *Pedagogical Variation* model also resonated clearly with Shore and Freire (1987:157) where a paradox arises, i.e. either

the need for the teacher to be directive, but at the same time to allow students the freedom to become self-directed.

The rationale for this investigation is that effective teaching is situational. This is the crux of the matter. It became the turning point in the research endeavour to formulate an effective blueprint for online learning and teaching in asynchronous discussion forums. The emerging conceptual *Pedagogical Variation* model, as shown in Chapter Six, is situational because it matches the e-moderator's online role and relationships to the e-learners' collaborative capabilities and knowledge construction abilities. From a further in-depth study of the research literature, it was noted, firstly, that Bass (1985:20) already concluded that "true transformational leadership requires employee empowerment not employee dependence". This sharpened the researcher's notions about online learning with respect to e-learner differences where some may strive to become independent, self-directed students which could be likened to category BF e-learners (Chapter Six). In this category, where e-learners are already empowered, there is little need for an e-moderator to provide additional motivational support; but to provide opportunities to engage these e-learners in a good number of tasks requires higher task-giving behaviour of an e-moderator. In category DH (Chapter Six), however, e-learners are not self-directed students but are dependent on an e-moderator's motivational support to a large extent for them to grapple with unfamiliar topics. This, in turn, requires lower task-giving behaviour of an e-moderator.

Secondly, Bass, Avolio and Goodheim (1987:9) also recognised that the transactional/transformational leadership paradigm did not mean that transactional leadership existed separately from transformational, but rather that these two dimensions of leadership were complementary in the pursuit of achieving desired outcomes. This complementary nature is illustrated in the conceptual framework for Model 1(Chapter Six),where transactional and transformational variables are seen as two independent variables, yet co-existing together in a 2 x 2 matrix.

Throughout the thesis, the argument against a 'one size fits all' (Jones, 2004) e-learning approach (i.e. constructivist approach) is highlighted. Several examples follow to show what can happen when mismatches occur between e-learner preferences for online learning environments and e-tutor pedagogical approaches to online teaching. For example, in certain cases (Wozniak, 2007:215) instructors, offering a constructivist learning

environment "can become discouraged by the lack of learner participation." Similarly, Dirkx and Smith (2004:134) studied "students' perceptions of and experiences in small, online collaborative groups". These researchers argue that "students demonstrate a profound ambivalence towards online collaborative learning" having to make a paradigmatic shift required of them from a traditional teacher-led learning environment. Rogers (1963:93) recognises "the shock and resentment that sometimes occur when students are faced with the necessity of making responsible choices."

Based on situational leadership, Grow (1991:125) contends that good teaching "matches the learner's stage of self-direction and helps the learner to advance toward greater self-direction." The *Pedagogical Variation* Model is designed to give e-moderating practitioners insight to ways of overcoming problems when mismatches occur in online teaching and how to support e-learners in the development of their online e-learning skills. For example when a self-directed online e-learner is mismatched with an authoritarian online tutor, problems may arise. The mismatch may cause the e-learner to rebel or retreat "into boredom" (Grow, 2004:137). If this were to happen the online tutor can implement a re-grouping strategy using the *Pedagogical Variation* Model by inviting the e-learner to join an appropriate learning space which matches the student's preferred learning approach.

Different problems arise when dependent e-learners are matched with an online tutor who delegates responsibility which e-learners are unable to handle, within a constructivist, collaborative online learning environment. Pratt (1988:169) exemplifies this dilemma by stating that e-learners "may feel frustration and anger when in a misguided spirit of democracy, they are expected to make decisions without sufficient knowledge or expertise." Grow (1991:138) re-iterates this insight contending that e-learners "wanting close supervision, immediate feedback, frequent (tutor) interaction, constant motivation, and the re-assuring presence of an authority-figure telling them what to do,...are unlikely to respond well to the delegating style of a nice humanist facilitator, hands-off delegator, or critical theorist who demands that they confront their own learning roles."

The *Pedagogical Variation* Model is useful for e-moderating practitioners and instructional designers because it focuses on how pedagogical leadership, both transactional and transformational in e-moderating plays a fundamental role in developing e-learning environments appropriate for differing e-learner online learning preferences (i.e. from a

traditional teacher-led, individualistic transmission perspective and, objectivist world view to a collaborative, student-led, socially oriented learning community. Practising e-moderators are able to use the *Pedagogical Variation* Model as a tool for continuing professional development (CPD) by reflection-on-action to develop new pedagogical strategies based on the conceptualisation of matching e-moderator competencies and leadership skills to e-learner collaborative and knowledge-producing abilities. The four quadrants of The *Pedagogical Variation* Model form a blueprint for a flexible, adaptable online teacher presence shifting from more teacher-centred activities (Quadrant CG) to highly learner-centred activities (Quadrant AE). Quadrant BF prescribes teacher presence for highly motivated, self-directed, independent e-learners and Quadrant DH prescribes teacher presence for e-learners who do come online to participate with e-peers but who, nevertheless, struggle in knowledge-construction. Critics may feel uneasy about 'compartmentalising' differing pedagogical approaches, contending that a flexible online tutor can vary their pedagogical approach within a single cohort of students with diverse collaborative and knowledge constructing abilities since the freedom of a collaborative learning environment allow e-peers to learn from each other. The *Pedagogical Variation* Model is designed to reduce e-learner frustration when there is a preference for closer tutor monitoring of 'work-in-progress' and at the same time the model offers an online tutor the opportunity to maximise learning outcomes by focusing on the varying degrees of e-learner collaboration and knowledge constructing abilities online by re-grouping e-learners where necessary into learning spaces that are more conducive for learning to take place. The adaptable characteristics of the model are such that e-learners may enjoy one particular pedagogical approach for one particular area of study and choose another pedagogical approach for another area of study. This could be exemplified by a novice e-learner in say, astronomy to elect for a teacher-led learning environment while the opportunity exists to elect for a student-led environment in say, sports' science.

15.6 Future possibilities

Kuhn (1970: 157) states that *"something must make at least a few scientists feel that the new proposal is on the right track, and sometimes it is only personal and inarticulate aesthetic considerations that can do that."*

In its scope, the thesis has perhaps been an ambitious investigation. It took on the task of evaluating three conceptual models for online teaching and learning which were created and developed in the initial stages of the study (Chapter Six). Kuhn's (1970) insight to

what it feels like when exploring a "new proposal" which is of great personal value describes the way in which the researcher endeavoured to articulate the outcomes of Empirical Study 2, as the final stage, of a larger research investigation to develop an innovative pedagogical blueprint for online teaching and learning in asynchronous discussion forums.

In the next section, the process and outcomes of the investigation are presented.

15.7 What the investigation reveals

When, in Empirical Study 2, the questionnaire for hypothesis testing to prompt responses to the open-ended questions was designed, a variety of answers was allowed for. These informed the research in their specific understandings, corroborating the intended answers (Belson, 1981). The answers also provided alternative viewpoints which Popper (2002) would argue were forbidden in the contextual basic statements that underpinned the models which led to the formation of the *Pedagogical Variation* model. This is to say, there were possible potential falsifiers that emerged

For example three e-responses indicated that Quadrant DH in Model 3 for *Pedagogical Variation* (Chapter Six) was a bad fit (Chapter Thirteen, Section 13). The underlying assumption for DH (Chapter Fourteen) is that when e-learners have difficulty in knowledge creation through collaboration, the motivational support of an e-moderator is important but not the increasing use of tasks when e-learners are struggling with a new or unfamiliar topic. The alternative viewpoints provided by these three e-responses suggested that *more* rather than *less* tasks should be given to e-learners who have difficulties in understanding a particular topic. It was found that what was meant is "each task could be divided into *more smaller chunks*."

Section B of the Hypothesis Testing Research Instrument which prompted e-respondents to match quadrants from Model 1 to quadrants in Model 2, gave a high degree of corroboration (Chapter 13) with some threats to falsification particularly to Quadrant DH in Model 3. There may be several reasons why e-respondents found more difficulty in agreeing with the underlying research assumption for quadrant DH. It could be that e-respondents were unfamiliar with this teaching strategy, expecting to give more tasks than fewer when students are dealing with an unfamiliar topic. Taking this as a more serious

matter, it is debateable as to whether there is an underlying potential falsifier in this part of the Conceptual Framework.

Quadrant DH in Model 3 appeared problematic where alternative viewpoints, suggested that a lot of *smaller* tasks rather than fewer tasks were to be given when e-learners with low cognitive ability would suffer from cognitive overload. E-responses indicated that there may have been an ambiguity in the wording of the questions in the Research Test Instrument.

This is, no doubt an area for further research in developing specific parameters to indicate "lots of" and "few" tasks. The next section discusses more fully the limitations of the current investigation.

15.8 The Limitations

Empirical Study 1 adapted a methodology based on Kelly's (1955) Personal Construct Psychology, by data gathering through the elicitation of bipolar constructs. E-moderating practitioners recognised how e-moderating competencies (weaving, archiving, summarising, scaffolding, knowledge construction and socialising) could be linked to their leadership skills in task-giving and motivational support. That is to say transactional and transformational leadership skills, respectively, as pioneered by Bass and Avolio (1996).

It was at the stage of analysing the bipolar statements, from both the emergent and implicit poles that gave rise to developing a strategy, using coding templates, for deciphering and coding units of analysis from each of the statements. At this stage of data analysis, it was important to define underlying basic statements with precision and clarity when designing the coding templates. There is, difficulty in using qualifying terms like 'a lot' or 'high', 'low' or 'a little' because what these mean to some people may mean something different to others. This leads to a limitation in the applicability of coding sheets using such qualifiers. Further research could be undertaken to develop more appropriate scales of measurement, possibly with a 7-point Likert Scale.

For example, the definition used for transactional behaviour is clear enough as task-giving, but then the descriptive measure for quantity of tasks, 'a lot' to some online teachers may be five or six to others maybe ten or eleven and then further some e-respondents may conjecture easy tasks or difficult tasks and what would this really mean? There is a limitation to the study in this respect.

Similarly for transformational behaviour, a useful insight is motivational support but again the qualifiers 'a lot' or 'a little' do not give sufficient precision. There is a need, here, to look further into the basic statements such as using frequent feedback or insufficient feedback and there again would this mean every time an online learner contributes a posting or after two or three postings? This poses another research problem for further investigation.

When the e-learner dimensions in Model 2 are questioned there again a limitation can be identified. The use of 'a lot' or 'little' collaborative capability and 'a lot' or 'little' knowledge construction ability again can be interpreted in a number of ways regarding the basic assumptions for online collaboration (participation?) and knowledge construction online (generating new ideas?).

Taking the above limitations into account, it was possible to observe, with the online hypothesis testing instrument how e-respondents from different global locations were able to contribute shared meanings which corroborated the underlying principles of the three conceptual models.

15.9 Looking on the Horizon

Popper's (2002) three measures (i) testability (ii) falsifiability and (iii) corroborability were appropriate strategies for this investigation, providing the necessary rigour to consider the *Pedagogical Variation* model as a viable alternative for the design and delivery of online courses in ALNs.

There is no doubt that, despite the limitations of the research as stated above and the small sample sizes, Empirical Study 1 (n=17) and Empirical Study 2 (n=21) that this investigation has proved to be a useful way of recognising the potential applicability of the *Pedagogical Variation* model for online teaching and learning. Future possibilities in refining the hypothetical models, Model 1, Model 2 and Model 3 are in no way limited. The underlying rationale of implementing a 2 x 2 matrix to bring together complementary online teaching strategies i.e. (i) task-giving, transactional behaviour and (ii) motivational support, transformational behaviour has proved to be sound. At the same time the implementation of a 2 x 2 matrix to bring together complementary online learning strategies i.e. (i) collaborative and (ii) knowledge construction behaviours has proved also to be sound.

The triangulation of data from Empirical Study 1, i.e. the corroborative statements elicited by a methodology borrowing ideas from Personal Construct Psychology and the data from

Empirical Study 2 gathered from the e-responses of the online questionnaire i.e. Hypothesis Testing Research Instrument signalled the basis of a sound design.
Investigations in making a number of refinements, such as clarity in the definitions for the four underlying variables (i) task-giving (ii) motivational support (iii) collaborative capability (iv) knowledge construction and further work to make explicit the use of construct such as *low, little few* and *high, a lot, many* would contribute, in no small measure, to our knowledge for effective online learning and teaching. Further refinement, also in the design of coding templates for content analysis would be useful. As Dooley (1984: 37) concludes "*since a single hypothesis test cannot prove the truth of a proposition...hypothesis testing is often repeated (replicated) several times for the same proposition. Different researchers, using different samples of subjects and similar or different indicators of the constructs, can each test hypotheses based on the same proposition.*"

15.10 Scope for Future Research in this Area of Study

As we move into the 21st Century both hardware and software infrastructures will be greatly enhanced. The need to develop and sustain pedagogically-driven e-learning and teaching will increase, as innovative learning technologies emerge where technology-driven initiatives may threaten and undermine the culture of education for lifelong learning. Rather we must seek to design pedagogically sound ways and means to bring about new advances in online learning and teaching. The evaluation of the Model for *Pedagogical Variation* has highlighted the need for implementing new ways of selecting research strategies to elicit what is really happening online and to create new pedagogically sound conceptual frameworks for effective online teaching and learning.

The research rationale to investigate how e-moderators agree with the Model of *Pedagogical Variation* has given further insights for the emergence of pedagogically sound practices that are situational with respect to e-learner characteristics. What suits one online learner may not suit another.
The final hypothetical *Pedagogical Variation* model includes a learning space for those who are comfortable in a constructivist environment, where teacher presence is less visible. For others who are more familiar with an instructivist environment, e.g. dependent learners then the *Pedagogical Variation* model also offers this kind of learning environment, where the online teacher is more visible than in a constructivist environment For those e-learners

who are independent and self-directed there is scope for selecting an environment where the online teacher recognises the skills of individual self-centred learners who have difficulty in collaborating with others or who would prefer a non-collaborative learning space.

The study is one where constructivism, as it is conceived in several theoretical frameworks as a 'one size fit all' learning environment (Ramsden, 1991; Goodyear, 1999; Laurillard, 2002) dismisses the need for alternative learning and teaching spaces (Chapter Four). By designing such constructivist frameworks, there is the hidden assumption that e-learners will achieve those goals that are pre-set by the online tutor, (i.e. teacher-led). In the *Pedagogical Variation* model there is room for a purely constructivist environment such as in Quadrant AE, where e-learners generate their own strategies for achieving goals that they themselves set as the presence of the online instructor becomes more invisible. The *Pedagogical Variation* model makes a clear distinction that there is a place for instructivism in an Online Type Three Classroom (Chapter 10) and a place for constructivism in an Online Type One Classroom (Chapter 10).

This study argues that e-learner differences with respect of differing collaborative capabilities and knowledge construction abilities are denied effective learning spaces due to their preference of learning in teacher-led online classrooms when confronted with a 'one size fits all' learning environment that is considered to adhere to a constructivist approach to learning..

The *Pedagogical Variation* model recognises instructivist approaches as a good learning environment for novice online learners and where students struggle with unfamiliar topics. Pedagogical leadership brings lurkers online by a lot of appropriate task-giving and a lot of motivational support. This is supported by strong evidence in the study (Chapter Thirteen).

When e-learners begin to find difficulties in the online classroom, due to lack of motivation and/ or cognitive overload because there is no visible online tutor providing direct guidance, such situations may be found as reasons for e-learner dropouts. Frankola (2000:54) contends that "the problem of dropout rates in e-Learning programmes has been argued over at length without any consistent conclusions about the degree of the problem, or a clear understanding of what factors contribute to learners dropping out, withdrawing or not completing e-Learning courses." A report in the Chronicle for Higher Education (2000) found that institutions report dropout rates ranging from 20% to 50% for online distance learners

(Frankola, 2000). Numerous studies (Rossett and Schafer, 2003; York, 2004; Romizowski and Mason, 2004; Tyler-Smith, 2005; have shown that the reasons for attrition rate are amongst others lack of online student motivation, cognitive overload, poorly designed courses and substandard, inexperienced online tutors.

Tyler-Smith (2007:74) advocates that these barriers to learning can be reduced by "increasing the levels of encouragement and timely support available to the student by both the teacher and the institution generally." Berge and Huang (2004) criticised course design and facilitation as contributing factors causing the increase in attrition rates for online learning. Another important factor to consider is cognitive overload which Kember (1989:230) identified as well as recognising how "distance learners also experience feelings of isolation and stress due to lack of organizational support, which may eventually lead to non-completion."

This study claims that the attrition rate of students in online courses would decrease because e-learners have the opportunity to study in online environments which are more conducive for their respective individual learning habits. It is proposed that the *Pedagogical Variation* model supports a principle of inclusion for lurkers and shirkers alike. E-moderators who recognise the underlying concept of providing many appropriate tasks with much motivational support for online learners who have little confidence in coming online to participate in a community of learners, should find that their online pedagogical leadership would enhance online learning.

The study signals a crucial way forward, as a catalyst, to understanding and creating opportunities for research, regarding how the nature of both asynchronicity and connectivity (technologically driven infrastructure of the learning platform) underpins pedagogically driven online learning within ALNs, locally, globally and internationally. The introduction of *Blended Learning* (BL), i.e. where online learning modules are integrated into face to face lecture programmes in HE and FE (Chew, Jones and Turner, 2007; Mistry, 2008) opportunities for researching not only e-moderator perceptions of their online roles but also e-learner perceptions of their online experiences. This offers much scope for future research in developing a sound, pedagogically driven, conceptual framework for online learning and teaching, in praxis, based on the proposed *Pedagogical Variation* model.

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APPENDICES

APPENDIX A

Table 4.1 E-moderator competencies

	Recruit		*Train*		*Develop*	
Quality/ characteristic	*1. Confident*	*2. Constructive*	*3. Developmental*	*4. Facilitating*	*5. Knowledge sharing*	*6. Creative*
A Understanding of online process	Personal experience as an online learner, flexibility in approaches to teaching and learning. Empathy with the challenges of becoming an online learner	Able to build online trust and purpose for others. Understand the potential of online learning and groups	Ability to develop and enable others, act as catalyst, foster discussion, summarize, restate, challenge, monitor understanding and misunderstanding, take feedback	Know when to control groups, when to let go, how to bring in non-participants, know how to pace discussion and use time online, understand the five-stage scaffolding process and how to use it	Able to explore ideas, develop arguments, promote valuable threads, close off unproductive threads, choose when to archive	Able to use a range of approaches from structured activities (e-tivities) to freewheeling discussions, and to evaluate and judge success of these
B Technical skills	Operational understanding of software in use, reasonable keyboard skills, able to read fairly comfortably on screen, good, regular, mobile access to the internet	Able to appreciate the basic structures of online conferencing, and the web and internet's potential for learning	Know how to use special features of software for e-moderators, e.g. controlling, weaving, archiving. Know how to 'scale up' without consuming inordinate amounts of personal time, by using the software productively	Able to use special features of software to explore learner's use, e.g. message history, summarizing, archiving	Able to create links between other features of learning programmes, introduce online resources without diverting participants from interaction	Able to use software facilities to create and manipulate conferences and e-tivities and to generate an online learning environment; able to use alternative software and platforms

APPENDIX A1

E-moderator Competencies (Salmon, 2011:106)

C Online communication skills	Courteous and respectful in online (written) communication, able to pace and use time appropriately	Able to write concise, energizing, personable online messages. Able to create 'presence' and 'visibility' in virtual environments	Able to engage with people online (not the machine or the software), respond to messages appropriately, be appropriately 'visible' online, elicit and manage students' expectations	Able to interact through e-mail and conferencing, and achieve interaction between others, be a role model. Able to gradually increase the number of participants dealt with successfully online, without huge amounts of extra personal time	Able to value diversity with cultural sensitivity; explore differences and meanings	Able to communicate comfortably without visual cues, able to diagnose and solve problems and opportunities online, use humour online, use and work with emotion online, handle conflict constructively
D Content expertise	Knowledge and experience to share, willingness to add own contributions	Able to encourage sound contributions from others, know of useful online resources for their topic	Able to trigger debates by posing intriguing questions. Know when to intervene, when to hold back	Carry authority by awarding marks fairly to students for their participation, contributions and learning outcomes	Know about valuable resources (e.g. on the web) and use them as sparks in e-tivities	Able to enliven conferences through use of multi-media and electronic resources, able to give creative feedback and build on participants' ideas
E Personal characteristics	Determination and motivation to become an e-moderator	Able to establish an online identity as e-moderator	Able to adapt to new teaching contexts, methods, audiences and roles	Show sensitivity to online relationships and communication	Show a positive attitude, commitment and enthusiasm for online learning	Know how to create *and sustain* a useful, relevant online learning community

E-moderator Competencies (Salmon, 2011:107)

APPENDIX A1

Personal Construct Psychology: Fundamental Postulate and 11 Corollaries
(Kelly, 1995/1999)

Item		The Theoretical Framework of Personal Construct Psychology	Reference Kelly 1955/1991 Vol.2
Fundamental Postulate		*"A person's processes are psychologically channelized by ways in which he anticipates events."*	1991:4
1	Construction corollary	*"A person will anticipate events by construing their replications."*	1991:4
2	Individuality corollary	*"Persons differ from each other in their construction of events."*	1991:4
3	Organisation corollary	*Each person characteristically for his convenience in anticipating events, a construction system embracing ordinal relationships between constructs."*	1991:5
4	Dichotomy corollary	*"A person's construct system is composed of a finite range of dichotomous constructs."*	1991:5
5	Choice corollary	*"Persons choose for themselves that alternative in a dichotomous construct through which they anticipate the greater possibility for the elaboration of their system"*	1991:5
6	Range corollary	*A construct is convenient for the anticipation of a finite range of events only."*	1991:5
7	Experience corollary	*"A person's construction system varies as they successiviely construe the replication of events."*	1991:5
8	Modulation corollary	*"The variation in a person's construction system is limite3d by the permeability of the constructs within whose range of convenience the variations lie."*	1991:5
9	Fragmentation corollary	*"A person may successively employ a variety of construction subsystems which are inferentially incompatible with each other."*	1991:5
10	Commonality corollary	*To the extent that one persong employs a construction of experience which is similar to that employed by another their processes are psychologically similar to those of the other person."*	1991:5
11	Sociality corollary	*"To the extent that one person construes the construction processes of another, they may play a role in a social process involving the other person."*	1991:5

Appendix A3

The Debate

An Instructivist approach or a Constructivist approach?

Over the past fifty years, the process of learning technology has been shaped by advances in learning and instructional theory. Much of the developmental work to date has been associated with instructivism (Margles, 1996). In the early days of computer-based learning, instructional designers used to map particular learning objects onto learner platforms. Therefore, it seems a natural progression that online learning has been associated with instructivism. As constructivism became the more favourable principle of teaching and learning, instructional designers have increasingly thought out how to create an environment in which learners can experience and develop sophisticated ideas for and amongst themselves from a variety of shared experiences.

Today, the constructivist approach is mainstream in online teaching and learning. The many literatures describe instructive and constructive approaches as both ends of the spectrum, and differentiate them sometimes clearly, but more often than not less clearly. Coghlan (2002) differentiates two approaches as follows:

Traditional (Instructivist)	**Constructivist**
Teacher driven	Student driven
Solo	Collaborative
Summative assessment	Formative assessment
Teachers 'give' knowledge	Students build (construct) knowledge
Teacher is expert	Students' knowledge is valid starting point
'Regurgitation' of information; memorization	Analysis, exploration, synthesis of information (higher order thinking skills)
Content based	Process based
Passive	Active
Clear end point	Ongoing

Source: Work by Michael Coghlan (WebCT Asia Pacific Conference, March 25 – 27 2002).

APPENDIX B

QUALITY	1.Idealised Influence Charismatic	2.Inspirational Motivational	3. Intellectual Stimulation	4.Individual Consideration	5. Contingent reward	6.Corrective Interventions
Understanding of online process	Charismatic online role model, Confident with online participation to focus e-learners to join conferences, visionary When intervening and judging e-learners' interests and needs, experimenting with different approaches.	Motivating e-learners by building online trust with a sense of inspiration & purpose; to know how to encourage e-learners who are hesitant of the virtual environment	Ability to act as catalyst, developing e-learners' capacity to think creatively by eliciting discussion, ability to summarize through focus on collaborative initiative, restate, challenge, monitor understanding and misunderstanding, stimulate through reflective feedback	Know when to control groups, when to let go, how to bring in non-participants, know how to pace discussion and use time on line that is fair for everyone	Able to explore ideas, develop arguments, promote valuable threads, close off unproductive threads, choose when to archive, build a learning community	Able to use a range of CMC conferencing approaches from structured activities to free wheeling discussions, and to evaluate and judge success of conferences
Technical skills	Charismatic in use of electronic discussion board as a user Confident in operational understanding of software : good access	Ability to inspire & motivate e-learners to appreciate the basic structures of electronic discussion boards and the Internet's far-reaching potential for learning	Equipped with Know-how to use special features of software for e-moderators, e.g. controlling, archiving to elicit creative, autonomous responses from e-peers	Ability to use special features of software to explore learner's use e.g. message history so as to better enhance individual learning	Able to create links between electronic discussion boards and e-mails that are task-oriented with specific features of learning programmes	Able to use software facilities to create and manipulate conferences to generate an online task-oriented learning environment
Online communication skills	Charismatic & Confident in written communication on-line 'in-absence-of-body'. Ability to respond courteously, politely, and respectfully even when flaming occurs	Ability to develop concise written communication that is inspiring and energizing, personable online messages enhancing e-learner motivation	Ability to engage with e-learners online by encouraging creative interactivity through development of written communication skills	Ability to value diversity with cultural sensitivity between others at personal levels and to communicate comfortably without visual cues	Ability to interact through e -mail and conferencing and achieve interaction to achieve task-oriented goals	Ability to intervene on electronic discussion boards to control progress of task-oriented e-tivities, know when to close down, weave & summarise objectively

Five E-Moderator Online Competencies relating to Six Leadership Factors (Rogers, 2004) **APPENDIX B1**

QUALITY	1.Idealised Influence Charismatic	2.Inspirational Motivational	3. Intellectual Stimulation	4.Individual Consideration	5. Contingent reward	6.Corrective Interventions
Content expertise	Confident and charismatic sharing of knowledge and experience with willingness to add own contributions ; enliven conferences through use of multi media and electronic resources	Ability to inspire and motivate e-learners by encouraging sound contributions from all online e-peers	Ability to trigger active participation amongst e-learners through debates and by posing intriguing questions that are e-learner-centred.	Facilitating participation and contributions by sharing knowledge & encouraging e-peers to strengthen their emerging knowledge construction	Know about valuable Internet resources and refer participants to them as task-oriented e-tivity, awarding 'points' for participation & contributions	Ability to intervene when directives of e-moderator become ignored by participant e-learners because of focus on task-centred e-tivities
Personal characteristics	Charismatic & Confident as an e-moderator demonstrating initiative to develop e-learners' participation & collaboration	Able to establish an online identity as e-moderator	Ability to develop adaptable and flexible new facilitating skills to new e-learner focused learning contexts, methods by understanding audiences & roles	Show sensitivity to online relationships and communication with positive, participative attitudes	Show serious commitment to online learning through achievement of goal-structured e-tivities	Know how to create a purposeful task-oriented online learning community through directive approach

Five E-Moderator Online Competencies relating to Six Leadership Factors (Rogers, 2004)

Appendix B2

E-moderating Behaviour On-line Questionnaire (January 2004)

INSTRUCTIONS: This questionnaire provides a description of your e-moderating style.
Thirty nine descriptive statements are listed below. Please judge how frequently each statement fits you.

KEY: 0= not at all; 1=once in a while; 2= sometimes; 3= fairly often; 4= frequently, if not always

1.	I instil pride in my e-learners for being associated with me	0 1 2 3 4
2.	I talk about my most important values and beliefs	0 1 2 3 4
3.	I talk optimistically about the future	0 1 2 3 4
4.	I re-examine critical assumptions to questions whether they are appropriate	0 1 2 3 4
5.	I spend time teaching and coaching	0 1 2 3 4
6.	I provide others with assistance in exchange for their efforts	0 1 2 3 4
7.	I focus attention on irregularities, mistakes, exceptions and deviations	0 1 2 3 4
8.	I fail to interfere until problems become serious	0 1 2 3 4
9.	I avoid getting involved when important issues arise	0 1 2 3 4
10.	I get others to do more than they expected to do	0 1 2 3 4
11.	I go beyond self-interest for the good of the group of e-learners	0 1 2 3 4
12.	I specify the importance of having a strong sense of purpose	0 1 2 3 4
13.	I talk enthusiastically about what needs to be accomplished	0 1 2 3 4
14.	I seek differing perspectives when solving problems	0 1 2 3 4
15.	I treat my e-learners as individuals rather than just a member of a cohort	0 1 2 3 4
16.	I discuss in specific terms who is responsible for achieving performance targets	0 1 2 3 4
17.	I concentrate my full attention on dealing with mistakes, complaints and failures	0 1 2 3 4
18.	I wait for things to go wrong before taking action	0 1 2 3 4
19.	I am absent when needed	0 1 2 3 4
20.	I heighten my e-learners' desire to succeed	0 1 2 3 4
21.	I act in ways that build my e-learners' respect for me	0 1 2 3 4
22.	I consider the moral and ethical consequences of decisions	0 1 2 3 4
23.	I articulate a compelling vision of the future	0 1 2 3 4
24.	I get my e-learners to look at problems from many different angles	0 1 2 3 4
25.	I consider an individual e-learner as having different needs, abilities and aspirations from others	0 1 2 3 4
26.	I make clear what an e-learner can expect to receive when performance goals are achieved	0 1 2 3 4
27.	I keep track of all mistakes	0 1 2 3 4
28.	I show that I am a firm believer in "if it ain't broke, don't fix it"	0 1 2 3 4
29.	I avoid making decisions	0 1 2 3 4
30.	I increase my e-learners' willingness to try harder	0 1 2 3 4
31.	I display a sense of power and confidence	0 1 2 3 4
32.	I emphasise the importance of having a collective sense of mission in my e-learning cohort	0 1 2 3 4
33.	I express confidence that goals will be achieved	0 1 2 3 4
34.	I suggest new ways of looking to how to complete an assignment	0 1 2 3 4
35.	I help my e-learners to develop their strengths	0 1 2 3 4
36.	I express my satisfaction when my e-learners meet expectations	0 1 2 3 4
37.	I direct my attention towards failures to meet standards	0 1 2 3 4
38.	I demonstrate that problems must become chronic before taking action	0 1 2 3 4
39.	I delay responding to urgent questions	0 1 2 3 4

Source: Adapted from "MLQ Manual": Bernard M. Bass & Bruce J.Avolio (1996)

Appendix B2

Covering letter

Susy Rogers MAPD Candidate, University of Glamorgan, Faculty of Humanities & Social Sciences
Email address: findsusy@yahoo.co.uk

January 2004

Dear Colleague,

I am attaching a questionnaire which I hope you will find time (not likely more than ten minutes) to complete. I am circulating to as wide an e-moderating audience as possible, within the University, to gather data for my dissertation MA (Professional Development) on colleagues' self-perceptions of the role of e-moderator behaviour online.

Please be assured that the data you provide will be treated with utmost confidentiality and used for the purpose of this research only.

Should you wish to keep complete anonymity, you may wish to print a hard copy to send via snail mail to me:

Susy Rogers, 16, Dennis Place, Bryncethin, Nr. Bridgend, CF32 9YP

Thank you for your time.

Susy Rogers
Faculty of Humanities and Social Sciences
University of Glamorgan
Pontypridd, UK.

Appendix B3

E-Moderator MLQ Research Instrument design (Rogers, 2004)

The following table illustrates the original drafting of my e-moderating (MLQ) research instrument to identify e-moderator self-rated perceptions of their leadership role as e-moderators in asynchronous electronic discussion groups. The response format design is a five-point Likert scale ranging from 'rarely or never' (1) to 'frequently, if not always' (5).

Research Instrument Design

Key: Factors (1-5) **Transformational Leadership**
Factors (6-8) **Transactional Leadership**
Factors (9) **Non-Transactional Leadership**
Factor (10) **Outcomes of Leadership**

Table: (9) Appendix B3 The 10-Factor instrument with the distribution of the 39 items

Factor	Factor Name	Items in e-moderating MLQ	Ques.
1 (IA)	**Idealized Attributes**	I instil pride in others for being associated with me	1
		I go beyond self-interest for the good of the group	11
		I act in ways that builds others' respect for me	21
		I display a sense of power and confidence	31
2 (IB)	**Idealized Behaviours**	I talk about my most important values and beliefs	2
		I specify the importance of having a strong sense of purpose	12
		I consider the moral and ethical consequences of decisions	22
		I emphasize the importance of having a collective sense of mission	32
3 (IM)	**Inspirational Motivation**	I talk optimistically about the future	3
		I talk enthusiastically about what needs to be accomplished	13
		I articulate a compelling vision of the future	23
		I express confidence that goals will be achieved	33
4 (IS)	**Intellectual Stimulation**	I re-examine critical assumptions to question whether they are appropriate	4
		I seek differing perspectives when solving problems	14
		I get others to look at problems from many different angles	24
		I suggest new ways of looking at how to complete assignment	34
5 (IC)	**Individualized Consideration**	I spend time teaching and coaching	5
		I treat others as individuals rather than just a member of a group	15
		I consider an individual as having different needs, abilities and aspirations from others	25
		I help others develop their strengths	35
6 (CR)	**Contingent Reward**	I provide others with assistance in exchange for their efforts	6
		I discuss in specific terms who is responsible for achieving performance targets	16
		I make clear what one can expect to receive when performance goals are achieved	26

		I express satisfaction when others meet expectations	**36**
7 (MBE-A)	**Management-by-Exception (Active)**	I focus attention on irregularities, mistakes, exceptions and deviations from standards	**7**
		I concentrate my full attention on dealing with mistakes, complaints and failures	**17**
		I keep track of all mistakes	**27**
		I direct my attention towards failures to meet standards	**37**
8 (MBE-P)	**Management-by-Exception (Passive)**	I fail to interfere until problems become serious	**8**
		I wait for things to go wrong before taking action	**18**
		I show that I am a firm believer in "if it ain't broke, don't fix it"	**28**
		I demonstrate that problems must become chronic before taking action	**38**
9 (LF)	**Laissez-faire**	I avoid getting involved when important issues arise	**9**
		I am absent when needed	**19**
		I avoid making decisions	**29**
		I delay responding to urgent questions	**39**
10 (EE)	**Extra Effort**	I get others to do more than they expect to do	**10**
		I heighten other's desire to succeed	**20**
		I increase other's willingness to try harder	**30**

Online Teaching (e-moderator criteria)

Coding Template 1 Transactional Task-giving

Use any of the following 'events'. Tasks/ activities/ e-tivities/ things to do/ work/ task-giving Use appropriate Qualifiers (F1) / (F2)	
F1 Low-Transactional=1	**F2 High-Transactional=2**
Little/few/small number/not so many/**small** array/sparse/ scant number/handful/less/fewer/less number of/least amount of. **N.B. a qualifier must be present for every 'event'** **Acceptable phrases/sentences:** No need for giving lots to do/without intervention/ e-learners generate their own work so little need for many e-tivities, it's better to keep to few/sparse/scant number of activities.	Many/ numerous/several/umpteen/ **large** (array/number/amount)/ ample/ plenty/ lots of/ heaps of/ loads of/ more/ greater number, amount of / masses. **N.B. a qualifier must be present for every 'event'** Acceptable phrases/sentences: I have to give e-learners as many tasks as I can, I find it useful to stretch the imagination/give lots to do. Too few tasks create boredom **Allow:** Implication that *detailed* archiving provides resources about online tasks for easy access (indirect task-giving)

Examples

Data Analysis		**Coding-1**	**Coding-2**
Record No.	Participant ID	Transactional-Low Construct	Transactional-High Construct
22	eM08	*- a chance to sort out misunderstandings[1] Than to give more tasks[1]*	*-several online tasks[2]*
95	eM17	*- I don't need to give so many tasks[1]*	*-I tend to keep the momentum with lots[2] of appropriate tasks[2]*
105	eM18	*-I dont' intervene too much[1,3]*	*-Archiving(detailed recording of outcome)[2]*
144	eM22	*-I only need to give little guidance[1]*	
152	eM23	*-without intervention[2,3]. No need to provide tasks as e-peers generate their own*	*-I scaffold a lot with many tasks[2]*
156	eM23	*-I tend to scaffold little by little[1] . . .I like to let them get on with it[1]*	
159	eM24	*-few simple tasks, suggestions and explanations[1]*	*-I notice that the more inputs[2](knowledge construction) I provide*
167	eM25		*-a lot of clear definitions[2]/concepts/ideas. -expect lots of challenges from me[2]*
177	eM26	*-sometimes task-overload[1] defeats the object of learning*	*-I post a lot of e-tivities[1]*
185	eM26	*-few simple tasks[1]*	*-lots of 'innovative' e-tivities help[2]*
187	eM27	*-re-combining subject-based ideas in fewer tasks[1]*	*-detailed archiving[2]*

APPENDIX B4

Online Teaching (e-moderator criteria)

Coding Template 2 Motivational Support / Transformational

Use any of the following 'events'. Motivation/motivational support/encouragement/inspiration/ +ve feedback/intervention/stimulation/+ve prompting/+ve prodding/+ve coaxing/+ve boosting (e.g. morale, self-confidence) Use appropriate Qualifiers (F3) / (F4)	
F3 Low-Transformational=3	**F4 High-Transformational=4**
Little/few/small number/not so many/**small** array/sparse/ scant number/handful/less/fewer/less number of/least amount of. **N.B. a qualifier must be present for every 'event'** **Acceptable phrases/sentences:** No need to give motivational support without extra motivation without too much intervention too much encouragement can be bad if students feel it is patronising do not require so much encouragement **Allow:** Do not need to post lots of personal emails	**large** (array/number/amount)/ ample/ plenty/ lots of/ heaps of/ loads of/ more/ greater amount of / masses. **N.B. a qualifier must be present for every 'event'** **Acceptable phrases/sentences:** A lot of motivational scaffolding/weaving e.g. weaving everyone's contributions together motivates/encourage/coaxes students **Allow:** Implication that – Sending numerous personal emails is a way to motivate student to come online Lots of personal/group emails is a good way to motivate e-learners who are reluctant to participate in online activities.

Examples

Data Analysis		**Coding-3**	**Coding-4**
Record No.	Participant ID	Transformational-Low Construct	Transformational-High Construct
53	eM14	*- I only need to give a scant amount of motivation*[3]	*- skill is needed to give students a lot of motivation online*[4]
60	eM16	*- too much motivation may stifle collaboration*[3]	
90	eM17	*- too much encouragement can be bad if students feel it is patronising*[3]	*- I give ample encouragement*[4]
106	eM18	*- not so much coaxing*[3]	
112	eM19	*- less need to motivate them*[3]	
129	eM20		*- a lot of coaxing from me*[4]
130	eM21	*- students do not require so much encouragement*[3]	*- A lot of motivation to boost confidence*[4]
141	eM22		*- I send personal emails to give my utmost motivational support*[4]
144	eM22	*- with little intervention*[1,3]	
145	eM22	*-students come online without extra motivation*[3]	*- students need lotd of personal emails to get them to come online*[4]
153	eM23		*-a lot of motivational scaffolding*[4]
161	eM24	*- student need little stimulation to participate*[3]	*-students will only come online with lots of friendly coaxing*[4]
179	eM26	*-little need for lots of encouragement*[3]	*-with a lot of motivation*[4]
185	eM26	*-I only need to give a handful of feedback*[3]	*-students need heaps of feedback*[4]
190	eM27	*-by giving little positive prodding*[3]	*-by giving a lot of positive prodding*[4]

Online Learning (e-learner criteria)

Coding Template 3 Collaborative Capability

Use any of the following 'events'. Learners/e-learners/peers/e-peers/students/online learners/member(s) of cohort/members of learning community Use appropriate Qualifiers (F5) / (F6)	
F5 High Collaborative Capability=5	**F6 Low Collaborative Capability=6**
+any of the following qualifiers-(a) Collaborative/interdependent/working together/concerted effort/co-operative/willingness to share/interactive/joint effort/teamwork/'give and take' from each other/groupthink/sharing of workload/group work/combined effort/mutual effort/'solidarity'/as a collaborative group/ online socialising to learn together. **+any of the following qualifiers-(b)** Great amount/more/much more/high amount/lots of/heaps of/masses of/ plenty of/ ample/vast amount of/ significant presence of/ actively/vigorously/keenly (& similar meanings) **N.B. One of each qualifier (a) and (b) is to be present for every 'event'** **Acceptable phrases/sentences:** Working well together Sharing each other's ideas Working towards mutual benefit Shared, joint-ownership of learning outcomes Pooling ideas together Joint action "everyone has a finger in the pie"	**+any of the following qualifiers-(a)** Collaborative/interdependent/working together/concerted effort/co-operative/willingness to share/interactive/joint effort/teamwork/'give and take' from each other/groupthink/sharing of workload/group work/combined effort/mutual effort/'solidarity'/as a collaborative group/ online socialising to learn together. **+any of the following qualifiers-(b)** Little/not much/small amount/not so much/lack of/sparse/scant amount of/ handful/lesser amount of/least amount of/ none/absence of/ non-existence of/resistant to (& similar meanings) **N.B. One of each qualifier (a) and (b) is to be present for every 'event'** **Acceptable phrases/sentences:** Unable to work together Great reluctance to share each other's ideas Independent learning Self-seeking learning, self-directed Learning at individual level 'going it alone' (significantly self-directed learning)

Examples

Data Analysis		**Coding-5**	**Coding-6**
Record No.	Participant ID	Collaborative Capability High Construct	Collaborative Capability Low Construct
14	eM59	*-v. collaborative e-learners*[5]	
27	eM11		*-lack of collaboration*[6]
43	eM12		*-non-collaborative e-learners*[6]
147	eM23		*-unable to collaborate or share their ideas with each other*[6]
91	eM17		*-independent and don't share their ideas with each other*[6]
112	eM19	*-keen to collaborate with each other*[5]	-
158	eM24	*-students work together in mutual benefit*[5]	*-great reluctance to share ideas, self-seeking*[6]
162	eM24		*-I have great difficulty to get students online*[6] (implies absence of collaboration online)
175	eM25	*-a lot of collaboration online*[5]	

APPENDIX B5

Online Learning (e-learner criteria)

Coding Template 4 Knowledge Construction Ability

Use any of the following 'events'. Learners/e-learners/peers/e-peers/students/online learners/member(s) of cohort/members of learning community Use appropriate Qualifiers (F7) / (F8)	
F7 High Knowledge Construction Ability=7	**F8 Low Knowledge Construction Ability=8**
+any of the following qualifiers-(a) Getting ideas/explaining concepts/debating issues/problem-solving ability/finding solutions to problems/cognitive presence/exploring new ways to develop ideas/concepts/knowledge/gaining insights to better understanding/getting to know/ expressing 'know-how'/developing expertise/competent in knowledge acquisition/'get the hang of'/ understanding the 'gist of things/'seeing the 'nitty gritty'/ knowledge construction **+any of the following qualifiers-(b)** Easily/frequently/often/a lot/in great amounts/lots of/heaps of/loads of/ masses of/ plenty of/ample/ vast amount of/ significant presence of/ actively/ vigorously/keenly/ skilfully (& similar meanings) **N.B. One of each qualifier (a) and (b) is to be present for every 'event'** **Acceptable phrases/sentences:** A lot of creative thinking goes on There is strong knowledge creation thro' online Discussion Meaningful exchange of ideas occurs often	**+any of the following qualifiers-(a)** Getting ideas/explaining concepts/debating issues/problem-solving ability/finding solutions to problems/cognitive presence/exploring new ways to develop ideas/concepts/knowledge/gaining insights to better understanding/getting to know/ expressing 'know-how'/developing expertise/competent in knowledge acquisition/'get the hang of'/ understanding the 'gist of things/'seeing the 'nitty gritty'/ knowledge construction **+any of the following qualifiers-(b)** With difficulty/sometimes/hardly ever/ little/not so much/sparse/scant amount of/handful/lesser amount of/ least amount of/none/absence of/none-existence of/ resistant to/ inadequately (& similar meanings) **N.B. One of each qualifier (a) and (b) is to be present for every 'event'** **Acceptable phrases/sentences:** A lot of misunderstandings keep cropping up Problem-solving is weak Students struggle with conceptual thinking/abstract ideas/ some online learners don't have the confidence to try out new ways of seeing things.

Examples

Data Analysis		**Coding-7**	**Coding-8**
Record No.	Participant ID	Knowledge Construction Ability High Construct	Knowledge Construction Ability Low Construct
47	eM13	*-A lot of creative thinking goes on*[7]	*-poor knowledge construction*[8]
59	eM14		*-little knowledge construction*[8]
112	eM19	*-busy constructing knowledge a lot*[7]	
141	eM22	*-students explore lots of new ideas with complex problem-solving*[7]	*-Do not show any signs of knowledge construction*[8]
147	eM23	*-very good at knowledge construction, generating their own ideas*	*-Students are finding it hard to 'get the hang' of problem-solving*[8]
162	eM24		*-I have great difficulty in getting students online*[8] (implies absence of knowledge construction online)

Empirical Study 2

INTERVIEWER INTERVIEW SCHEDULE

The research investigation is seeking to find e-moderator views and perceptions about online teaching and learning using a methodology based on Personal Construct Psychology. It focuses on

- E-moderator task-giving and motivational support and
- how e-moderators view their e-learner capabilities for collaboration and knowledge construction.

List of 6 Elements

1. Weaving
2..Archiving
3..Summarising
4..Scaffolding
5..Knowledge Construction
6..Socialising

Use the following stages in the process.

1. Show the interviewee a list of 6 online teaching skills (called elements for the purpose of the research) which have been grouped into threes (triads) as shown in the chart below. Ask the interviewee to select any triad of their choice.

Table of 20 Triads

TRIAD 1 Weaving Archiving Summarising	**TRIAD 2** Archiving Summarising Scaffolding	**TRIAD 3** Archiving Scaffolding Knowledge constructing	**TRIAD 4** Summarising Weaving Scaffolding	**TRIAD 5** Summarising Scaffolding nowledge constructing	**TRIAD 6** Scaffolding Weaving Knowledge constructing	**TRIAD 7** Knowledge constructing Weaving Socializing
TRIAD 8 Weaving Archiving Scaffolding	**TRIAD 9** Archiving Summarising Knowledge constructing	**TRIAD 10** Archiving Scaffolding Socializing	**TRIAD 11** Summarising Weaving Knowledge constructing	**TRIAD 12** Summarising Scaffolding Socializing	**TRIAD 1 3** Scaffolding Weaving Socializing	**TRIAD 1 4** Knowledge constructing Summarising Socializing
TRIAD 1 5 Weaving Archiving Knowledge constructing	**TRIAD 1 6** Archiving Summarising Socializing	**TRIAD 1 7** Archiving Knowledge constructing Socializing	**TRIAD 1 8** Summarising Weaving Socializing			**TRIAD 1 9** Knowledge constructing Scaffolding Socializing
TRIAD 20 Weaving Archiving Socializing						

2. Make a note of the interviewee Research ID (e.g. eM01, eM02, eM03) in the 1st column of the Record Sheet. Then write the Triad Number in the 2nd column (e.g. T1, T2, T3)

Example of a Data Entry record for an individual interviewee

ID	Triad	2 (same)		1(diff)	Bipolar Statements
eM01	T1	1	3	2	(same)/emergent pole
					(different)implicit pole

3. Give the interviewee the three separate postcards with one of the elements on each that are in the selected triad.

4. Remind the interviewee that the research study is looking at 2 aspects of online teaching and learning.

   Firstly, the way in which an e-moderator perceives online teaching with respect to the amount of TASK-GIVING (a lot or a little) and the amount of MOTIVATION given (a lot or a little).
   Secondly, the way in which an e-moderator perceives their e-learners with respect to their COLLABORATIVE capabilities (high or low) and their KNOWLEDGE CONSTRUCTION abilities (high or low).

5. Tell the interviewee that you are going to switch the tape-recorder on.
6. Start with the following question: "Please *show* me which 2 cards are alike in one way or another? (interviewee shows 2 cards) Make a note of the 2 elements selected in the 3rd column of the Record Sheet. With further prompting, continue. "And the other card is different in some respect?" Make a note of the 3rd element selected in the 4th column the Record Sheet.

   "Thank you."

7. Begin: "Now can you tell me why the 2 cards are alike?
   What kind of relationship is there between these two in terms of
   - e-moderator task-giving and motivational support? AND/OR in terms of
   - e-learners' collaborative capabilities and knowledge construction abilities?"

"Thank you." Make hand-written notes on the data entry form in the appropriate section for 2 elements which are the same (emergent bipolar construct) as a guide for tape transcription purposes.

8. Continue:

"Now can you tell me why the 3rd card is different, in terms of
- e-moderator task-giving and motivational support? Or in terms of
- e-learners' collaborative capabilities and knowledge construction abilities?"

"Thank you." Make hand-written notes on the data entry form in the appropriate section for the 3rd element which is different (implicit bipolar construct) as a guide for tape transcription purposes.

9. Ask interviewee whether they he/she would like to continue. If yes, the process starts with the selection of either the same triad (with different/same selection of elements) or another triad If no, thank the interviewee for their participation in the research study. Switch the tape-recorder off.
The process continues until the interviewee decides to withdraw or the interviewer has sufficient data (e.g. when the interviewee has exhausted the reasons for similarities and differences). It also may be a question of how much time an interviewee can give.

APPENDIX C

HYPOTHESIS TESTING RESEARCH INSTRUMENT

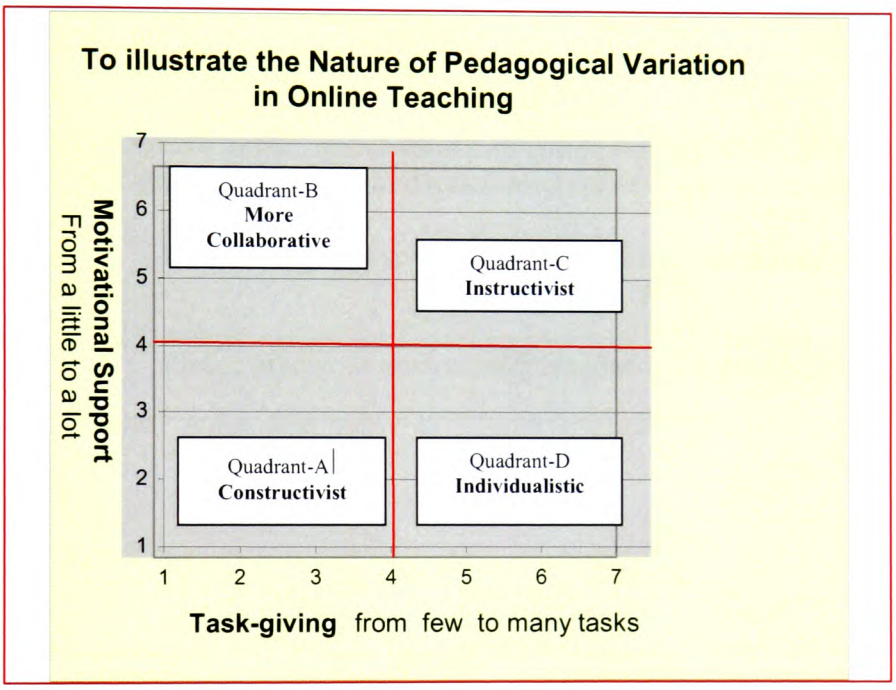
Online Questionnaire

AIM: To Evaluate a Model of *Pedagogical Variation*

for Online Teaching and Learning

SECTION A

Source Material-1 Please have a look at this diagram carefully.



Q.1 **Quadrant-A** above shows an online teacher who is providing very little task-giving and very little motivational support in a discussion forum.

What kind of e-learning group would this be appropriate for?

Please give your answer with reasons in the box below

Q.2 **Quadrant-B** above shows an online teacher who is providing fewer tasks and more motivational support in a discussion forum.

What kind of e-learning group would this be appropriate for?

Please give your answer with reasons in the box below:

Q.3 **Quadrant-C** above shows an online teacher who is providing as much task-giving as possible and much motivational support in a discussion forum.

What kind of e-learning group would this be appropriate for?

Please give your answer with reasons in the box below

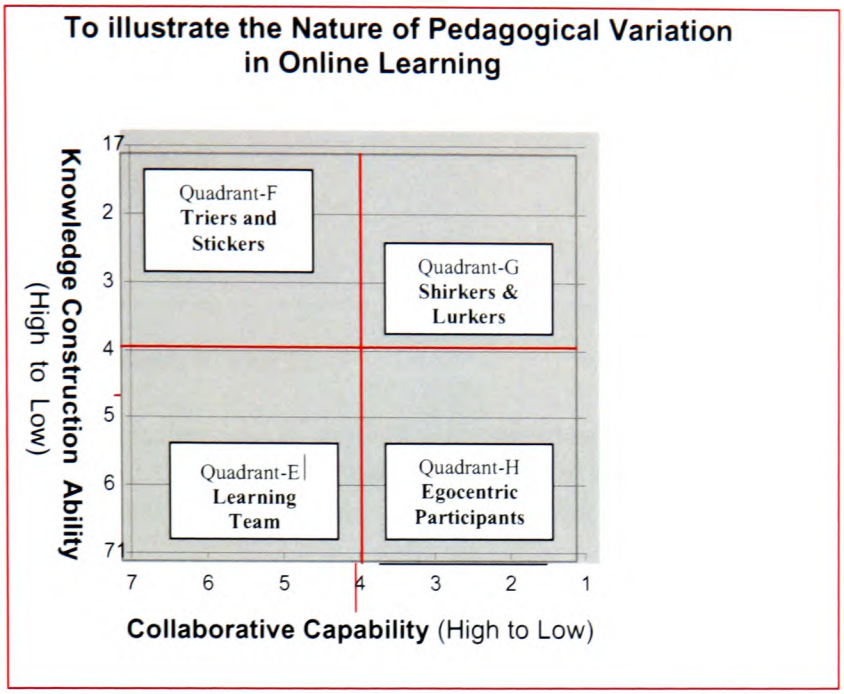
Q.4 **Quadrant-D** above shows an online teacher who is providing as much task-giving as possible with little motivational support in a discussion forum.

What kind of e-learning group would this be appropriate for?

Please give your answer with reasons/ in the box below:

SECTION B

Source Material-2 Please look at this diagram carefully.



I am looking for a match between online teaching style and e-learner capability.

So the next four tasks are for you to match up the Quadrants in the first diagram with the Quadrants in the second diagram.

T.1 **Quadrants A and E.**

Imagine a teacher who is providing very little task-giving and very little motivational supporting a discussion forum and e-learners who have a high collaborative capability and high knowledge construction ability. What kind of a match would you say this is?

Please tick appropriate box

Good	Bad	Doesn't matter	Don't know

Your Reasons/comments

T.2 **Quadrants B and F.**

Imagine a teacher who is providing fewer tasks and more motivational support in a discussion forum and e-learners who have a high collaborative capability but little knowledge construction ability. What kind of a match would you say this is?

Please tick appropriate box

Good	Bad	Doesn't matter	Don't know

Your Reasons/comments

T.3 **Quadrants C and G.**

Imagine a teacher who is providing as much task-giving as possible and much motivational support in a discussion forum and e-learners who have a low collaborative capability and low knowledge construction ability. What kind of a match would you say this is?

Please tick appropriate box

Good	Bad	Doesn't matter	Don't know

Your Reasons/comments

T.4 **Quadrants D and H.**

Imagine a teacher who is providing as much task-giving as possible with little motivational support in a discussion forum and e-learners who have a low collaborative capability and high knowledge construction ability. What kind of a match would you say this is?

Please tick appropriate box

Good	Bad	Doesn't matter	Don't know

Your Reasons/comments

Thank you for your co-operation. It is much appreciated. If you would like feedback/progress on this research, *please tick box.* ☐

Appendix C2

Contents of email distributed with the 4 pages of online questionnaire as an attachment

Date: Tuesday 12 October 2010

Dear < > (named participant for sampling)

Re: *Invitation to Evaluate a Pedagogical Model for Online Teaching and Learning*

I am currently bringing together an online sampling group to evaluate a model for online teaching and learning. Your participation as a member of this online sample would be much valued.

If you are able to give a little time to consider your responses to the eight questions in the attached online questionnaire and return your responses to me in the attachment I should be grateful. Please be assured that your data will be held secure adhering to the University Ethical Guidelines of confidentiality and anonymity. Please do not hesitate to contact me should you require further details.

I look forward to receiving your response no later than Friday 22nd October 2010.

With Thanks

Susy Rogers
Doctoral Student-
University of Glamorgan
Faculty of Humanities and Social Sciences (HASS)

Email: susy4phd@yahoo.com

UK Mobile: 07901551354

APPENDIX D

Initial Pilot Study n=3 respondents

Record No	ID	Triad	Emergent Pole		Implicit	Statements for *Emergent* Pole (Records 1-15)	Code	Quad
1	George	T1	1	3	2	I give the students many suitable tasks[2], and keep them highly motivated[4]	24	C
2	George	T12	4	6	3	Socialising encourages eLearners **to interact well**[5] and **exchange their ideas freely**[7] with one another.	57	E
3	George	T17	5	6	2	**Creative peer-group interaction**[5] fosters a **developing knowledge bank rich in ideas**[7].	57	E
4	George	T8	1	4	2	Only a little weaving and scaffolding is necessary to motivate[3] a student-centred, collaborative cohort. These eLearners generate their own problem-solving tasks with great enthusiasm, so there is little need for extra task-giving[1].	13	A
5	George	T4	1	4	3	Weaving and scaffolding motivates eLearners a lot[4] to keep up with a small amount of tasks[1].	14	D
6	Mary	T3	4	5	2	Often an eLearner-centred, **very collaborative**[5] **peer-group is v.good in knowledge construction**[7].	57	E
7	Mary	T18	1	6	3	Weaving and socialising contribute to online collaboration. Sometimes there is **a lot of social banter**[5,] **with little problem-solving**[8].	58	H
8	Mary	T20	1	2	6	I give my eLearners ample tasks[2] and a great amount of encouragement[4].	24	C
9	Mary	T14	5	6	3	**I have a highly collaborative group**[5]. The ePeers **construct knowledge easily**[7] by using each other's ideas creatively	57	E
10	Mary	T6	4	5	1	Scaffolding supports the emergence of ideas when **eLearners are weak in problem-solving**[8]. There may be **a lot of socialising and collaboration**[5] but not necessarily task-oriented.	58	H
11	Linda	T9	2	5	3	Many self-directed learners do not need to be motivated as much[3].They follow their own ideas, and like to be occupied with the subject-based e-tivities I provide[2].	23	B
12	Linda	T7	5	6	1	ePeers **learn oline through many social insights**[5] **A lot of problem-solving is done like this**[7].	57	E
13	Linda	T11	1	5	3	**Creating new meanings**[7] is the essence of eLearning.Many independent thinking eLearners **do this frequently**[7], **without much collaboration**[6].	67	F
14	Linda	T15	2	5	1	Knowledge compacting into the archive allows 'lurkers' to manage their own **limited knowledge construction**[8] **without collaboration with others**[6]	68	G
15	Linda	T19	5	6	4	There's no need to motivate ePeers[3] who keenly take advantage of the freedom to explore ideas freely with little e-tivities necessary from me[1] to spark them off.	13	A

Rec.No	Statements for *Implicit* Pole (Records 1-15)	Code	Quad
1	Archiving is useful for lurkers **who don't come online**[6,] **demonstrating lack of knowledge construction**[8].	68	G
2	No further exchange of ideas.Summarising can motivate students by showing how to **tackle problem-solving tasks with which they struggle** [8]. Peer group likes to socialise to **collaborate**[5] but **weak in getting ideas together**[8]	58	H
3	Maybe lack of confidence **prevents 'lurkers' from coming online**[6.8].The archives are task-based resources.	68	G
4	**Many valued responses**[7] from a **busy interactive forum**[5] is very useful for information retrieval.	57	E
5	At the end of an e-tivity phase, summarising completes the collection of e-learner responses This takes less time for a cohort which **seldom posts**[8] **ideas due** to **difficulties in peer-group participation**[6]	68	G
6	Archiving could be very useful for 'lurkers' **who are reluctant to join in**[6] **and unlikely to show** any sign of **knowledge construction**[8]. An archive is a stored knowledge base to keep in	68	G
7	Summarising is like a signal that the thread is coming to an end. V. useful for students **who** find it **not so easy to develop skills in problem-solving**[8] even though they **try hard to collaborate with each other**[5].	58	H
8	Socialising online **brings people together for collaboration and v.necessary**[5] **for lots of peer-gtoup exchange of ideas and knowledge construction**[7].	57	E
9	I tend to summarise when ePeers have exhausted a thread and I notice that they are ready to generate their own problem-solving activity.This means that I do not need to give more e-tivities[1], nor further motivation[3] as they are keen to get on with their new thread.	13	A
10	Weaving helps to collect ideas together from everyone. This is important when ePeers **seek their own independent ways for successful problem-solving**[7] **without collaborating**[6].	67	F
11	Summarising helps ePeers to focus on a task, especially **those who struggle with difficult concepts**[8.] There is a **high level of student-based collaboration**[5], but ePeers do not always reach consensus..	58	H
12	eLearners can learn from hindsight as the eModerator weaves their contributions in a summary. Highly motivated[3], self-directed eLearners like to be kept busy with lots of subject-based, problem-solving tasks[2].	23	B
13	Collecting previous contributions in a summary is useful for actively interdependent ePeers who are v. keen [3] to develop their own problem-solving strategies, so that I do not need to provide so many e-tivitiieies[1].	13	A
14	**Knowledge is expanding all the time**[7] as ePeers **collaborate enthusiastically**[5]	57	E
15	A restricted frame to support non-confident eLearners is necessary with few tasks[1] and lots of motivation[4].	14	D

Record No	ID	Triad	Emergent Pole		Implicit	Statement for Emergent Pole (Records16-26)	Code	Quad
16	eM04	T2	2	3	1	Summarising and archiving bring the thread to a close. But before I decide to close a thread, I will have given my cohort lots of tasks to do[2] without much motivation[3] because they are very keen to get tasks completed.	23	B
17	eM04	T16	3	6	2	Less motivated eLearners are greatly empowered[4] by socialising,with less tasks[1] to accomlish.	14	D
18	eM05	T10	2	6	4	eLearners **may collaborate together but not necessarily focused on the topic**[5], but more to get to know each other with **little knowledge construction**[8]	58	H
19	eM06	T5	4	5	3	When **online students are unlikely to collaborate**[6]**, being more independent and self-directed,there can be a great deal of knowledge construction**[7]**.** I do not need to provide so much motivation[3], but they expect a lot of e-tivities[2] to engage in.	2367	BF
20	eM06	T13	1	4	6	When lurkers come online it is important to scaffold and weave as much as possible and provide as much motivation as possible[4].Lots of appropriate tasks[2] have to be selected to encourage effective online participation.	24	C
21	eM07	T14	6	5	3	When ePeers **interact enthusiastically by collaborating**[5] and generating **lots of new ideas for developing new knowledge**[7]**,** there is little need for me to motivate[3] ePeers nor to provide numerous e-tivities[1] because the cohort is fully engaged in their self-generated creative problem solving initiatives.	1357	AE
22	eM08	T8	1	4	1	When I pull together student's ideas by weaving it motivates online group[4] to solve problems more easily,because everyone's contribution is valued, whether it's good or not so good[4]. Gives me chance to sort out misunderstandings instead of giving more tasks to do[1].	14	D
23	eM08	T12	4	6	3	**Lurkers have great difficulty in socialising and collaborating**[6]**. There is very little online knowledge creation by them**[8]**.**A lot of scaffolding and feedback by email is used to motivate eLearners[4] who hesitate to come online together with many	2468	CG

						appropriate e-tivities[2].		
24	eM09	T15	1	5	2	Weaving helps to guide highly motivated ePeers in the generation of their own problem-solving initiatives, especially when they tend to be interdependent.These eLearners do not need extra motivation from me[3],nor do they need many e-tivities from me[1].	13	A
25	eM09	T20	2	6	1	Archiving helps **ePeers who struggle with e-tivities and knowledge construction**[8] because there is a permanent record of their previous problem-solving e-tivities. These ePeers **enjoy socialising a lot**[5] **but their collaboration does not lead to focus** on the discussion topic. These ePeers need fewer e-tivities[1] with a lot feedback[4]	1458	DH
26	eM10	T11	1	3	5	Summarising helps to reduce the number of postings when a thread attracts much discussion by **highly collaborative ePeers**[5,] giving necessary guidance to develop ideas by acknowledging and weaving **everyone's problem-solving contributions**[7].	57	E

2nd Pilot Sample n= **7** respondents

Record No.	Statement for Implicit Pole (Records 16-26)	Code	Quad
16	Scaffolding encourages further engagement[4] with an increasing number of e-tivities[2].	24	C
17	Archiving provides ample resources for off line study[2] providing a great deal of motivation[4]	24	C
18	**Highly collaborative eLearners**[5]do not need much scaffolding because there are lots of ideas that develop into **a comparatively large amount of knowledge creation**[7].	57	E
19	It's a good idea to summarise when there are sufficient postings to show that an e-tivity is completed satisfactorily by cohort.This usually happens soon after a new thread is created when ePeers are highly interactive, generating new ideas; so less tasks[2] from me because group is self-generating their own tasks.	13	A
20	Giving eLearners lots of opportunities to socialise means that lurkers are encouraged to **collaborate however litlle that may**[6] be to begin with and **to start developing some ideas**[8] to share with others online.	68	G
21	I summarise when the postings become too numerous.This usually happens when ePeers have **collaborated well together**[5] and **created much new knowledge**[7] amongst themselves.	57	E
22	Sometimes things go out of hand with too many bulky postings from **self-confident individual/independent students**[6], so I check frequently to see whether the **several online tasks are complete**[7] to put away postings (i.e. close thread) in archive.	67	F

23	Summarising allows for a didactic approach, i.e. 'telling' eLearners how a solution to a problem-based activity had been eventually reached by them.	0	-

236

24	Archiving provides independent,self-directed highly motivated eLearners to access discussion threads to look up previous ideas.They do not require a lot of motivation from me[3], but are eager to tackle the many e-tivities, which I provide[2].	23	B
25	Weaving everyone's contribution to a thread greatly motivates ePeers who cannot cope with too many e-tivities; I give a few problem-solving e-tivities[1] with lots of feedback[4].	14	D
26	Others in the cohort are quite different.Self-confident,self-reliant[3]independent; **extremely good at problem-solving**[7],showing tacit knowledge from previous experiences. Expect lots of challenges[2] from me, but **not keen to share ideas**[6].	2367	BF

APPENDIX D3

Complete Set of Findings for

Represetative Research Sample (n=17)

The findings are presented in 2 sorted parts

(i) Statements from Emergent Pole
(Pages 359-374)

(ii) Statements from Implicit Pole
(Pages 375-388)

48	eM13	T10	2	4	6	Archiving and scaffolding may not be curriculum focused. When a community of ePeers	13	A	1
48						enjoy the freedom of generating their own problem-solving ideas, there is little need			1
48						for a lot of e-tivities[1] to spark interest. These ePeers are extremely well motivated and			1
48						would resent any extra motivation from me[3].			1
57	eM14	T6	1	4	5	Scaffolding and weaving is e-Tutor centred reflecting peer-group cohesion. Enthusiastic	57	A	1
57						**ePeer collaboration[5] leads to a deeper level of knowledge construction[7].**			1
87	eM17	T20	1	6	2	Sometimes it's better to keep to sparse activities[1] and not so much motivation[3].	13	A	1
96	eM17	T12	3	6	4	Where ePeers are actively engaged, generating their own problem-solving tasks,I do	13	A	1
96						not endeavour to post lots of e-tivities[1]. More encouragement is unecessary[3].			1
105	eM18	T1	1	3	2	Sometimes a group does not need a lot of encouragement,[3] the students are highly	13	A	1
105						motivated and create their own problem-solving activities,, so I don't intervene too			1
105						much[1,3].			1
117	eM20	T13	1	4	6	There are occasions when I provide minimal tasks[1], with little intervention[3].	13	A	1
117						Weaving and scaffolding are useful to guide forum discussion.			1
142	eM22	T5	4	5	3	Scaffolding and knowledge construction can be v. beneficial for students' understanding	13	A	1
142						about the purpose of an e-tivity, especially how it relates to the assessment structure			1
142						of a module. Actively participating students who are v,keen achievers need little			1
142						motivation from me[3]. Only a few e-tivities are required[1] to get them started.			1
152	eM23	T2	2	3	4	I summarise frequently and bring a thread to a close by archiving, without intervention[1]	13	A	1
152						No need to provide tasks[1] as ePeers have freedom to generate their own. Scaffolding			1
152						is not required as ePeers are v.self-motivated so less need to empower them[3].			1
183	eM26	T2	2	3	4	I summarise when the discussion in a thread has reached a realistic target. That is to	13	A	1
183						say ePeers have not needed many e-tivities[1] to generate their own ideas. At the same			1
183						time they worked so well without my having to coax them further[3].Then I archive.			1
191	eM27	T14	3	6	5	For some very motivated eLearners, my presence online is almost negligible[1,3],	13	A	1
191						with only a few tasks[1] required			1
28	eM11	T1	1	3	2	Weaving promotes active engagement to foster online understandings.Self-directed,	23	B	2
28						independent eLearners need little motivation from an eModerator[3], but lots of			2
28						e-tivities[2]			2
45	eM12	T9	3	5	2	Knowledge construction online allows eLearners to explore new ways of dealing with	23	B	2
45						complex issues/problems which is mainly taken advantage of by v. keen[3] independent			2

45						self-directed eLearners who do not need much motivation from me[3] but expect to get			2	
45						lots of interesting e-tivities[2].			2	
54	eM13	T17	2	5	6	Knowledge constructing with weaving encourages process of building up and out. When a group is keen to				23 B
54						to make progress, then I give numerous online tasks[2] without any extra encouragement[3].				
63	eM14	T18	1	3	6	Summarising and weaving allow eModerator analysis of individual meanings from	23	B	2	
63						eLearner contributions. When eLearners are actively engaged in lots of e-tivities[2] their			2	
63						motivation is high so there is little need to take extra time to encourage them[3].			2	
80	eM16	T19	5	6	4	Socialising helps peer-group interactions using inter-connectivity, motivating	23	B	2	
80						collaboration. I provide lots of tasks[2] to students who are v.enthusuastic, independent			2	
80						and self-directed[3].			2	
90	eM17	T10	2	4	6	Scaffolding and archiving are ways of helping eLearners to develop cognitive	23	B	2	
90						skills online. Too much encouragement can be bad if students feel it is			2	
90						patronising3. They work better with lots of e-tivities that spark the imagination[2].			2	
99	eM18	T9	3	5	2	There are occasions when I am flexible,giving lots of tasks[1] and not so much	23	B	2	
99						friendly coaxing[3] when e-learners are busy.			2	
122	eM20	T1	2	3	1	When a thread is ready to be closed, a summary is an effective way of expressing	23	B	2	
122						appreciation of ePeers' participation in the numerous e-tivities provided[2,] without			2	
122						much empowerment from me[3]. I can then archive the postings to the module online			2	
122						repository.			2	
131	eM21	T4	1	4	3	I find weaving and scaffolding stimulates students to tackle the numerous online	23	B	2	
131						problem-solving tasks[2] without any further coaxing necessary[3].			2	
131						weak showing little interdependence and group-think6.			2	
137	eM22	T5	3	5	4	Highly motivated eLearners do not get any extra coaxing from me[3], but I like to	23	B	2	
137						provoke their critical thinking with as many appropriate tasks I can[2].			2	
189	eM27	T2	2	3	4	Summarising and archiving gives me opportunities to show eLearners what they	23	B	2	
189						have achieved. They do not need a lot of confidence boosting[3] as they always			2	
189						expect lots of e-tivities from me[2].			2	
30	eM11	T8	1	4	2	Weaving is a way of attempting to prevent 'lurking', encouraging everyone[4] to post	24	C	3	
30						ideas to the discussion forum. Many emails do help to do this too[4].Scaffolding also			3	
30						helps to make tasks easier when lots of e-tivities are delivered[2] and eLearners lose			3	

30						confidence in participating.			3
35	eM11	T20	1	2	6	Archiving is an activity for bringing thread to a close after weaving ePeer online	24	C	3
35						contributions. If the pace of a discussion forum is slow, some eLearners become			3
35						frustrated and prefer to continue by 'lurking'.Archives present a sound knowledge base			3
35						for keepingin touch. Sending emails with lots of motivation[4] and lots of interesting			3
35						e-tivities[2] can encourage eLearners to stay on course.			3
37	eM12	T8	2	4	1	Archiving and scaffolding are useful to control 'lurking'. These eLearners need lots of	24	C	3
37						encouragement and support[4] with as many appropriate e-tivities[2] as can be managed.			3
58	eM14	T4	1	3	4	Summarising and weaving are eTutor-centred activity to elicit key points or issues	24	C	3
58						recognising inputs. The benefit of this for ePeers is that it provides a lot of motivation[4]			3
58						for those who are new to online learning and feel uncomfortable in exposing their ideas``			3
58						in public. By sending emails with lots of interesting e-tivities[2], I can give more support.			3
60	eM14	T4	1	4	3	Weaving is an active intervention highlighting key points from all participants with	24	C	3
60						with significant clues to support ideas. It's an effective measure for giving lots of			3
60						encouragement[4] to students who are less motivated and tend to 'lurk' and who need			3
60						lots of appropriate e-tivities[2] to get them back online.			3
61	eM14	T3	4	5	2	Establishing an online identity as the eModerator and facilitator is v.important, to	24	C	3
61						give eLearners confidence that their work will be valued and supported by expert			3
61						guidance (scaffolding).This greatly enhances eLearners[4] to collaborate without too			3
61						many complex e-tivities[1] for novices to start with.			3
67	eM15	T12	3	6	4	Summarising and socialising brings about the 'social construction of reality'.	24	C	3
67						To do this successfully an eModerator gives lots of encouragement[4] and lots of			3
67						interesting e-tivities[2] to spark online activity for those eLearners who complain that			3
67						online learning is too time-consuming.			3
71	eM15	T18	1	6	3	Weaving and socialising are a means of actively engaging eLearners on tasks with	24	C	3
71						interpersonal skill. Less active eLearners need lots of encouragement[4] to come online			3
71						with a great deal of guidance,usually by email, to engage with the many appropriate			3
71						e-tivities[2] to spark eLearner interest.			3
76	eM15	T6	4	6	1	Scaffolding allows triggering discussions by posing intriguing questions especially	24	C	3
76						for eLearners who tend to 'lurk' and need a huge amount of encouragement[4] with			3

76						lots of appropriate e-tivities[2] to keep them online.			3
78	eM16	T19	4	6	5	Less able eLearners depend on eTutor support provided by scaffolding and encouraging	24	C	3
78						socialising. Those eLearners who tend to 'lurk' can be given lots of encouragement[4]			3
78						through personal emails with many interesting e-tivities[2] to spark eLearner interest.			3
89	eM17	T13	4	1	6	I give a good number of tasks[2] as well as providing as much motivation as I	24	C	3
89						can[4] by scaffolding and weaving.			3
164	eM24	T11	3	5	1	Summarising encourages ePeers to develop skills for knowledge creation. When they	24	C	3
164						are apprehensive about posting their ideas I need to send personal emails, offering a			3
164						good number of e-tivities[2] related to their work experiences and lots of motivation[4].			3
178	eM26	T10	2	4	6	Archiving and scaffolding are useful in keeping 'lurkers' informed about online	24	C	3
178						responses. I give them lots of opportunities to engage in many interesting			3
178						e-tivities[2] and give them a great deal of encouragement[4] to overcome their			3
178						shyness of coming online.			3
187	eM27	T13	4	6	1	We need to adopt new teaching approaches because we have no visual cues to	24	C	3
187						engage 'lurkers' to join in But this could be an advantage to them(lurkers);being			3
187						invisible.Frequent emailing is a good way of encouraging 'lurkers' to come online[4]			3
187						and detailed archiving keeps 'lurkers' informed about the mant accesible tasks[2].			3
196	eM27	T5	3	4	5	Scaffolding and summarising lets me give feedback which empowers ePeers a lot[4]	24	C	3
196						and who need many interesting e-tivities[2], based on their particular career.			3
51	eM13	T10	2	6	4	Archiving allows for eLearner 'social banter' because all learning material is stored	14	D	4
51						away for easy access. These eLearners need lots of encouragement[4] with only a few			4
51						e-tivities[1] to create interest so as to prevent information overload.			4
55	eM13	T1	1	5	3	Weaving is highly motivational[4] by exploring ideas from all participants to create new	14	D	4
55						tapestry. V.useful in empowering[4] ePeers who are struggling with online study. Better			4
55						to give few tasks[1] to prevent cognitive overload.			4
66	eM14	T2	3	4	2	Scaffolding and summarising provide eLearners with active online eModerator	14	D	4
66						contributions to facilitate conceptual learning process.This motivates ePeers a lot[4] to			4
66						share ideas and work with fewer tasks[1] when they lose confidence in their ability.			4
84	eM16	T20	1	6	2	Important for eModerator to develop peer-group support focused on motivating[4]	14	D	4
84						peer-group interdependence, by socialising and weaving peer-group responses for			4

84						effective outcomes, especially with fewer e-tivities[1] where ePeers are struggling.			4
129	eM21	T8	4	2	1	E-learners get a lot of coaxing from me[4] but not so many tasks[1].	14	D	4
129						They tend to need more time in getting to focus on an e-tivity.			4
29	eM11	T11	3	5	1	I summarise when ePeers begin **energising online debates confidently**[7] by **much**	57	E	5
29						**collaborative sharing of ideas**[5]**.** The e-tivities provide a framework for knowledge			5
29						construction.			5
31	eM11	T14	5	6	3	Socialisation provokes participation amongst e-Peers to collaborate online.	57	E	5
31						With **enthusiastic collaboration**[5] ePeers **achieve deeper levels of understanding**[7]			5
32	eM11	T9	2	3	5	Archiving and summarising is achieved by eTutor focus for bringing thread to a close.**V.**	57	E	5
32						**busy collaborative**[5] ePeers can exhaust a thread with **much deep level understanding**[7]			5
36	eM11	T2	2	3	4	Archiving and summarising are tutor-based reporting activities to collect eLearner	57	E	5
36						responses. This can be v. time-consuming when **v.collaborative eLearners**[5] create lots			5
36						of postings **with a great deal of critical thinking**[7].			5
44	eM12	T15	2	5	1	Archiving and knowledge construction allows the recording of **purposeful debate in**	57	E	5
44						**in thread achieved by ePeers**[7]**.** This occurs in a **highly**			5
44						**collaborative environment online**[5].			5
50	eM13	T4	3	4	1	Summarising gives ePeers an opportunity to recapitulate their ideas confidently	57	E	5
50						and to **share ideas with a high level of collaboration**[5]. This results in a **deeper level**			5
50						**of understanding the underlying concepts of an e-tivity** [7]together with some scaffolding.			5
50									5
73	eM15	T18	3	6	1	ePeers value e-moderator summaries because these show creative reflection on	57	E	5
73						effective communication by socialisation (i.e. how **ePeers work hard to collaborate**			5
73						**successfully online**[5]**. A deeper level of learning is achieved**[7].			5
77	eM16	T17	5	6	2	**A great deal of knowledge creation**[7] occurs through peer-group interactivity for	57	E	5
77						constructivist development and exchange of ideas. Group discoveries are made by **v.**			5
77						**keen collaboration**[5]			5
175	eM25	T14	5	6	3	In my cohort students **generate many new ideas**[7] through **a lot of collaboration**	57	E	5
175						**online**[5]. Summarising and archiving the online postings can be very			5
175						time-consuming.			5
65	eM14	T5	3	5	4	Summarising is seen to have an eTutor focus to provide a knowledge bank to highlight	67	F	6

65						contributions. **Many ideas developing new knowledge**[7] are generated by independent			6
65						self-directed eLearners **who disregard online collaboration**[6], for whatever reason.			6
70	eM15	T6	1	5	4	From eTutor weaving and knowledge construction eLearners can reflect on peer-group	67	F	6
70						inputs developing new ways of creative understanding. Self-directed,eLearners who			6
70						are independent **critical thinkers**[7] find this kind of eTutor support v.useful as they			6
70						**prefer to collaborate with each other to a less extent**[6]. Outcomes show a **high level of**			6
70						**knowledge construction**[7].			6
74	eM15	T5	4	5	3	Scaffolding and knowledge construction are used for triggering debate, energising	67	F	6
74						online knowledge-sharing amongst peer-learners. I do this a lot with eLearners who			6
74						**do not collaborate so much with each other**[6] but independently show			6
74						their ability to develop **a lot of deep level critical thinking**[7].			6
91	eM17	T17	2	5	6	My students can **construct knowledge well online** [7] but rhey are more **independent**	67	F	6
91						**and don't share their ideas with each other**[6].			6
130	eM21	T3	4	5	2	**There is a lot of knowledge construction**[7], even though there is **little collaboration**	67	F	6
130						**amongst participants**[6]. They tend to work on an individual level.			6
27	eM11	T1	2	3	1	Archiving and summarising can be a means for closing unproductive thread when	68	G	7
27						'lurkers' **fail to post ideas for knowledge construction**[8] due to **lack of**			7
27						**collaboration**[6].			7
38	eM12	T3	2	4	5	Archiving and scaffolding promotes passive eLearner role; encourages 'lurking'. Some	68	G	7
38						**eLearners who are reluctant to appear online**[6] **do not develop knowledge creation**[8].			7
41	eM12	T17	2	6	5	Archiving and socialisingbrings about the social construction of reality. This is	68	G	7
41						sometimes difficult to achieve online when eLearners show signs of 'lurking' behaviour			7
41						finding it **stressful in coming online to participate**[6] and **unable to share ideas for**			7
41						**knowledge creation online**[8].			7
42	eM12	T16	2	3	6	Archiving and summarising provoles participation. These eTutor actions give eLearners	68	G	7
42						a sense of being valued, however **weak in knowledge construction**[8] their contributions			7
42						may appear. These eLearners are **uncomfortable to collaborate online**[6] for fear of			7
42						'losing face' in public.			7
43	eM12	T16	2	6	3	By archiving an eModerator uses the skill of enlivening peer-group	68	G	7
43						discussions by selecting ideas for later retrieval. 'Lurkers' use the archive			7

43						to gain confidence by seeing how others interact to develop new ideas			7
43						**before attempting to participate themselves**[6,8].			7
59	eM14	T3	2	5	4	In some instances it might be found that an eLearner becomes less active as	68	G	7
59						spectator and observer of tutor inputs/outputs. 'Lurkers' have tendencies to			7
59						develop little **knowledge construction**[8] in fear of being misunderstood. Their			7
59						shyness **prevents their appearance in online collaboration**[6].			7
85	eM16	T12	4	6	3	Scaffolding and socialising are ways of showing sensitivity to online relationships	68	G	7
85						in building confidence when 'lurkers' are **shy and need more time to come online**[6]			7
85						A lot of empowerment is needed to support 'lurkers' who **find it difficult to engage in**			7
85						**a high degree of critical thinking**[8].			7
147	eM23	T2	3	4	2	Scaffolding and archiving are useful in developing knowledge construction.	68	G	7
147						ePeers value my feedback, especially when students are **finding it hard 'to get the hang'**			7
147						**of problem-solving**[8]. Also there may be a **lack of enthusiasm to collaborate online**[6].			7
162	eM24	T13	1	4	6	I have **great difficulty to get students online**[6,8]. Scaffolding and weaving are ways	68	G	7
162						of promoting online discussions. But emails can keep contact with those who			7
162						have not come online.			7
168	eM25	T3	2	5	4	In some instances it might be found that an eLearner becomes less active as spectator	68	G	7
168						and observer of tutor inputs/outputs. 'Lurkers' have tendencies to develop **little**			7
168						**knowledge construction**[8] in fear of being misunderstood. Their shyness **prevents**			7
168						**their appearance online**[5].			7
184	eM26	T15	2	5	1	Knowledge compacting occurs when archiving eLearners contributions. **Those**	68	G	7
184						**who are reluctant to come online**[6] will find the archives v.useful to keep			7
184						informedabout forum. There is **v. little evidence of online knowledge**			7
184						**construction**[8].			7
34	eM11	T10	4	6	2	Socialising is an effective way of creating links to subject-matter by social	58	H	8
34						construction. Scaffolding encourages weaker students, especially, to develop skills to			8
34						**enable them to cope with difficult concepts**[8] and **collaborate effectively online**[5].			8
81	eM16	T13	4	6	1	Socialising with scaffolding gives an e-moderator a chance of adopting new	58	H	8
81						teaching approaches without visual cues. This means that ePeers are given a large			8
81						**degree of freedom to collaborate**[5], which **does not always develop a deeper level of** .			8

81						**understanding**[8]			8
83	eM16	T15	1	2	5	Weaving and archiving allows eTutor enrichment of collaborative inputs where	58	H	8
83						eLearners show a **keen sense of collaboration**[5] but more for social reasons rather than			8
83						focusing on **knowledge construction, which tends to be weak**[8].			8
101	eM18	T6	1	4	5	Weaving and scaffolding can bring about a greater understanding in knowledge	58	H	8
101						creation to eLearners who muddle along **without sufficient skills to create knowledge**[8]			8
101						but who are **enthusiastic collaborators**[5].			8
136	eM21	T19	4	5	6	Whilst there is **a lot of socialising and collaborating**[5]**, there is little knowledge**	58	H	8
136						**construction**[8]. I need to use a lot of scaffolding for ePeer understanding of			8
136						e-tivities.			8
158	eM24	T13	4	1	6	**Students work together in mutual benefit**[5] **but do not produce many creative ideas**[8].	58	H	8
158						This means that there is a lot of scaffolding to do and weaving.			8
39	eM12	T9	2	5	3	An eModerator has the know-how to develop intriguing questions that enighten	1357	AE	9
39						critical thinking for *model* answers. V. enthusiastic ePeers[3],who **collaborate keenly**[5] **by**			9
39						exchanging ideas **achieve deep level understanding and critical thinking**[7]. There is then			9
39						the necessity of only a few e-tivities[1] to spark interest in a thread.			9
40	eM12	T15	1	5	2	Weaving is an encouraging process on inter-relating ideas;lateral thinking with	1357	AE	9
40						subject-matter. Keen ePeers, without much motivation from me[3],can develop **deep**			9
40						**level understanding**[7] through **high degree of collaborative efforts online**[5]. They enjoy the			9
40						freedom of creating their own exploratory tasks, with a few topic-focused e-tivities			9
40						from me[1].			9
47	eM13	T2	2	4	3	Archiving is an activity for bringing thread to a close. The archived discussion will show	1357	AE	
47						**on**[7] without being prompted by lots of e-tivities[1].			9
47									9
53	eM13	T5	3	4	5	Summarising and scaffolding are a means of exploration of ideas to elicit eLearner	1357	AE	9
53						understandings. **Frequently ePeers enjoy the freedom to explore new ways of problem-**			
53						**solving**[7] without the need of many e-tivities[1]. These eLearners tend to be v.enthusiastic			9
53						**collaborators online**[5]. They do not need to be empowered by eTutor[3], being v. motivated			9
53						themselves.			9

56	eM13	T13	1	4	6	Using scaffolding and weaving the eModerator can offer ePeers the freedom to explore ideas confidently with eModerator guidance. This enables ePeers to develop **a lot of knowledge creation**[7] through a rich diversity of ideas and a keen sense for a **lot of collaborative effort**[5]. They do not need to be given many e-tivities[1] and because they are extremely keen to reach successful outcomes, I provide only a little motivational support[3].	1357	AE	9		
64	eM14	T7	1	6	5	Weaving with socialising is a less formal way of learning by incidental tacit knowledge. Some very keen ePeers do not need to be empowered[3] to explore new ideas of their own. They will not need many e-tivities[1] to spark interest in a thread because they **collaborate fervently**[5] to reach consensus in their **eagerness to create many new patterns of knowledge**[7].			9	1357	AE
82	eM16	T14	3	5	6	Knowledge construction and summarising demonstrates eModerator efforts to pre-detremine/ establish learning objectives. This is not always welcome by highly **collaborative eLearners**[5] who debate with a **keen sense of knowledge construction**[7]. They do not need many tasks[1] to spark ideas nor do they need to be given extra motivation[3].	1357	AE	9		
86	eM16	T7	5	6	1	Knowledge construction can be achieved by building online 'trust' in exploring ideas confidently together.Highly motivated[3], interdependent ePeers create **a deep level of learning**[7] through a **high degree of collabrative efforts**[5].In such a case,few tasks from me are required[1].	1357	AE	9		
88	eM17	T14	5	6	3	Very motivated[3] eLearners who **collaborate well**[5],can generate their own tasks. No need then for eModerator to provide them tasks[1].**V.good problem-solvers**[7].	1357	AE	9		
95	eM17	T8	1	4	2	Weaving and scaffolding encourages ePeers to develop a sense of group identity. When this occurs, **plenty of sound problem-solving goes on**[7,] **with lots of collaborative energy**[5]. I don't need to give so many tasks[1] then, nor empower ePeers[3] as they are keen achievers.	1357	AE	9		
106	eM18	T20	1	6	2	Weaving and socialising encourages groupwork.This brings about **a lot of knowledge generation**[7]and I am able to observe pleasing outcomes with not so much coaxing[3]. ePeers prefer the freedom to decide on ther own tasks, so I refrain from giving too many e-tivities[1]. They are able to **work together very well, sharing each other's ideas**[5].	1357	AE	9		

112	eM19	T16	3	2	6	I keep tasks to a minimum[1] when I notice ePeers are **keen to collaborate with**	1357	AE	9
112						**each other**[5]. At the same time there is less need to motivate them[3] as they are			9
112						**busy constructing knowledge a lot**[7].			9
144	eM22	T14	5	3	6	I only need give little guidance[1] to **highly collaborative ePeers**[5] **who are able to develop**	1357	AE	9
144						**many critical thinking skills in knowledge creation**[7] with little intervention[1,3].			9
156	eM23	T5	4	5		I tend to scaffold little by litlle[1]. I like them to get on with it[1] and keep in the	1357	AE	9
156						background. The ePeers enjoy the freedom of generating their own ideas. Their **keen**			9
156						**interactivity & collaboration**[5] means that there is no need to motivate them[3].			9
156						**Their knowledge creation skills are exemplary**[7].			9
169	eM25	T14	5	6	3	The ePeers **work together v.well as a learning team**[5], **debating**	1357	AE	9
169						**issues with much energy**[7].They only need a few e-tivities to get started[1].The			9
169						ePeers are v.enthusiastic and keen so there is no necessity of providing a			9
169						great amount of motiviation[3].			9
179	eM26	T8	1	4	2	Weaving and Scaffolding allows me to show how well ePeers develop their	1357	AE	9
179						ideas online through **very active collaboration**[5], resulting in **high levels of**			9
179						**knowledge creation**[7] without the necessity of much task-giving[3]. Their			9
179						enthusiasm stems from their high degree of self-motivation, so their is little point			9
179						to provide further motivation[3].			9
190	eM27	T11	1	5	3	**Many new meanings are created**[7] as **ePeers collaborate effectively to exchange**	1357	AE	9
190						**their ideas**[5]. Highly motivated ePeers need little encouragement from me[3] and			9
190						few e-tivities[1].			9
194	eM27	T19	5	6	4	v. motivated[3] ePeers are given opportunities to **explore ideas confidently**[7] with a	1357	AE	9
194						**sharing & exchanging expertise**[5] Little need for eModerator to provide many			9
194						tasks[1].			9
68	eM15	T12	3	4	6	Summarising and scaffolding contribute to eModerator process to support/maintain	2367	BF	10
68						ongoing effective learning. Independent, very enthusiastic self-directed eLearners			10
68						thrive on many interesting e-tivities[2] without the necessity of any empowerment from			10
68						me[3]. They show **little sign of online collaboration**[6]. Their **learning outcomes show much**			10
68						**individual problem-solving activity**[7].			10
69	eM15	T14	3	6	5	With the the eTutor online activity of Summarising ePeers rely on eTutor to reflect on	2367	BF	10

69						peer-group ideas and insights. There is little socialising in an online group in which			10
69						eLearners can be **so keen to work independently**[6] from each other that they are given			10
69						lots of e-tivities[2] to keep them busy. It is unecessary to provide lots of motivation[3]			10
69						because they are able to work enthusiastically with a **high degree of knowledge**			10
69						**construction**[7].			10
108	eM19	T8	1	4	2	I use weaving and scaffolding to help ePeers to collaborate more with each other.Some	2367	BF	10
108						ePeers **avoid sharing their ideas with others or building knowledge together**[6]. They			10
108						are **extremely skilfull in critical thinking at an individual level**[7], and thrive on many			10
108						stimulating tasks[2] without any further prompting from me[3].			10
125	eM20	T9	2	5	3	When **self-directed,independent** [6] **students are v.creative online**[7] they would need lots	2367	BF	10
125						of tasks[2] because they are highly motivated[3] **but do not share ideas**[6].			10
128	eM21	T17	5	6	2	Some eLearners are **uncomfortable when they are asked to socialise and**	2367	BF	10
128						**collaborate with each other**[6]. **They can construct very sound knowledge, independently**			10
128						**on an individual basis**[7]. I only need to give a little motivation using feedback as			10
128						a way to encourage further engagement[3] in the many tasks I provide[2].			10
138	eM22	T11	3	1	5	Summarising and weaving pulls together student postings. It's vital to keep the	2367	BF	10
138						momentum going with lots of thought-provoking e-tivities[2] when students are			10
138						**reluctant to share ideas or collaborate with each other**[6]. **Lots of sound knowledge**			10
138						**building goes on**[7], without additional encouragement from me[3].			10
146	eM22	T1	2	3	1	Summarising follwed by archiving brings a thread to a close. After **much knowledge**	2367	BF	10
146						**construction**[7], the discussion topic becomes exhausted and ePeers are			10
146						ready to move on to the next stage in an online debate. Some ePeers prefer to work			10
146						on an individual level **without collaboration**[6] with lots of tasks[2]. I do not have to			10
146						engage in excessive feedback to encourage ePeer participation[3].			10
157	eM24	T9	3	2	5	Summarising is a sign to show ePeers that the discussion thread has come to a close.	2367	BF	10
157						The archived postings give ePeers a permanent record of the inter-related messages			10
157						which have contributed to **extensive knowledge construction online**[7]. Some ePeers are			10
157						**hesitant in sharing their ideas and are less collaborative**[6]. They enjoy working			10
157						independently on numerous tasks[2] and without additional encouragement from me[3].			10
170	eM25	T3	5	2	4	The idea of sharing ideas can be problematic for some ePeers who **prefer**	2367	BF	10

170						**to work independently**6 and are capable of producing excellent arguments			10
170						**about a topic**[7]. They do not need any further coaxing from me[3], I keep them			10
170						occupied with lots of e-tivities[2].			10
182	eM26	T7	1	6	5	Weaving ePeers contributions is a way of encouraging self-directed, independent	2367	BF	10
182						ePeers to develop collaborative skills when there is **a lack of sharing ideas and**			10
182						**little collaboration**[6]. Their **knowledge creation skills are well developed**[7] and			10
182						I found little point in coaxing them to work[3] as they were v. enthusiastic and engaged in			10
182						all of the many e-tivities[2] they were working on.			10
186	eM26	T18	1	6	3	Weaving eveybody's contributions often leads to improved collaboration through	2367	BF	10
186						socialising. This becomes necessary where eLearners have a tendency to work at an			10
186						individual level, with **little incentive to developing collaborative skills**[6].There is a **strong**			10
186						**sense in knowledge building**[7] and great enthusiasm in engaging in the abundant online			10
186						tasks[2], so I intuitively feel that there is no advantage in motivating them further[3].			10
188	eM27	T4	1	4	3	Weaving and scaffolding contribute to giving ePeers positive feedback on their postings,	2367	BF	10
188						as a means of developing knowledge construction online. Some ePeers **do not show**			10
188						**much enthusiasm in sharing ideas or collaborating**[6]. They are best left on their own to			10
188						develop their **well informed knowledge**[7] at an individual level. As a result there is little			10
188						need to motivate them[3] as they are keen make progress through the many e-tivities[2].			10
46	eM12	T20	2	4	1	Archiving provides a focus for message history;V.helpful for 'lurkers' to keep informed	2468	CG	11
46						of the many appropriate e-tivities availble to them[2].I send lots of encouraging emails[4]			11
46						to eLearners who are **reluctant to socialise or collaborate online**[6] **and showing little**			11
46						effort of **creating new knowledge online**[8].			11
49	eM13	T11	1	2	5	Summarising and weaving are eTutor centred activities with focus on eLearner inputs.	2468	CG	11
49						These eTutor activities are v. useful to give eLearners **who dislike the idea of**			11
49						**participating online**[6] a lot of motivation[4] with lots of interesting e-tivities[2]. In this way			11
49						eLearners are likely **to develop skills for online knowledge construction which they do**			11
49						**not yet possess**[8].			11
72	eM15	T13	1	6	4	During Weaving and socialising eLearner contributions are interwoven into a	2468	CG	11
72						collaborative tapestry by the eModerator. This gives eLearners who are **reluctant**			11
72						**to collaborate**[6] online lots of motivation[4]. By providing many interesting e-tivities[2]			11

72						using emails, 'lurkers' will **start to develop skills for knowledge creation online**[8].			11
75	eM15	T19	4	5	6	Knowledge constructing and scaffolding provide eModerator tasks to elucidate/clarify	2468	CG	11
75						difficult concepts. These eModerator activities are greatly needed by eLearners who are			11
75						**reluctant to collaborate**[6] and who are **very weak in knowledge construction**[8].Personal			11
75						emails to eLearners can provide lots of motivation[4] and offer many exciting e-tivities[2].			11
92	eM17	T9	2	3	5	Summarising is an opportunity to give students acknowledgement of their online	2468	CG	11
92						**contributions, however sparse and unstructured they may be**[8]. Some **ePeers do not**			11
92						**collaborate on a regular basis**[6] and they need a lot of encouragement to do so[4].			11
92						They like to experiment with many authentic tasks based on thier own experiences[2].			11
92						I can then close the thread and archive the outcomes.			11
118	eM20	T12	3	4	6	Summarising helps to clear postings from the discussion forum to prevent a	2468	CG	11
118						cluttered up look, that could be intimidating for less confident eLearners.			11
118						Scaffolding also boosts confidence for those who **do not do so well in**			11
118						**knowledge creation**[8]. They are **less likely to collaborate for fear of losing face.**			11
118						**online**[6] and I send frequent emails to encourage eLearners a lot[4]. It is vital to			11
118						develop rapport with lots of exciting e-tivities[2].			11
127	eM21	T10	2	4	6	Less confident eLearners expect a lot of feedback. I can do this by scaffolding.	2468	CG	11
127						They need lots of praise and encouragement[4] to come online. I like to send			11
127						personal emails with opportunities to try out numerous simple e-tivities[2].			11
127						These members of the eLearning group are unlikely to demonstrate **high**			11
127						**calibre insights in an online topic**[8] and **do not make much effort to collaborate with**			11
127						**each other**[6].			11
141	eM22	T1	2	3	1	I find it really hard to bring 'lurkers' online. I send personal emails to give my	2468	CG	11
141						utmost motivational support[4]. I do a lot of detailed archiving for access to lots of			11
141						tasks[2]. For some reason **they do not participate/collaborate**[6]. **Do not show me any**			11
141						**signs of knowledge construction**[8].			11
149	eM23	T6	4	1	5	Weaving and scaffolding help students develop their ideas for creative knowledge	2468	CG	11
149						construction. This is especially necessary to give students more confidence[4] to			11
149						**collaborate more fully**[6] so as to be better able to share ideas **for greater knowledge**			11
149						**construction which is currently lacking**[8]. Many interesting thought-provoking e-tivities[2]			11

149						are made accessible via personal emails.			11		
160	eM24	T6	5	4	1	Scaffolding gives me opportunities to praise ePeers contributions and efforts, not only .	2468	CG	11		
160						outcomes. I provides **lots of tips to increase eLearner knowledge construction**			11		
160						**which lacks deep level thinking**[8]. I allow 'lurking' or browsing to start with since some			11		
160						**novice eLearners are reluctant to come online to collaborate**[6]. Prompt dealing is needed					
160						to stop participant aggravation over lurkers who are perceived as 'free-loaders' or silent			11		
160						using the contributions of other ePeers instead of contributing their own.Much			11		
160						encouragement[4] using emails can prevent online disruptions. A lot of thought-			11		
160						provoking e-tivities[2] are essential to spark the imagination.			11		
167	eM25	T9	2	3	5	I can't seem to get to some of my cohort.I know they are there because the software monitoring				2468	CG
167						system, but **they don't join in the thread**[6,8].That's why I still try to motivate them[4] with a					
167						lot of **clea**r definitions,conceprts,ideas[2].			11		
193	eM27	T9	2	3	5	Archiving and summarising are very good ways of showing eLearner efforts	2468	CG	11		
193						online. There are some eLearners who are **reluctant to collaborate**[6] and find			11		
193						**knowledge creation difficult**[8]. They lack motivation so I send lots of			11		
193						emails to stimulate their interest[4] and numerous simple e-tivities[2] to spark their			11		
193						imagination.			11		
33	eM11	T8	1	2	4	Weaving and archiving are ways of bringing together eLearner contributions to deposit	1458	DH	12		
33						for later retrieval. This provides a lot of motivational support[4] especially for those			12		
33						eLearners who are **unable to develop skills for online knowledge creation**[8] I tend to give			12		
33						only a few e-tivities at a time[1] to spark enough interest in a thread for the sharing of			12		
33						ideas. **Collaboration then occus with great enthusiasm**[5].			12		
52	eM13	T16	3	6	2	By summarising I am creating confidence through personal feedback in summary. My	1458	DH	12		
52						eLearners need lots of encouragement[4] for a healthy exchange of ideas because			12		
52						the weaker eLearners have **difficulty in responding with creative ideas**[8] **and cannot**			12		
52						**cope**[8] with too many e-tivities. These have to be paced at a fairly slow rate, with fewer.			12		
52						tasks[1]. **Enthusiastic collaboration occurs**[5] by socialising with few desired outcomes.			12		
62	eM14	T11	1	5	3	Weaving and knowledge construction provide pertinent questions and thought-	1458	DH	12		
62						provoking activities to underpin conceptualization of topics. This is a way of			12		

62						giving lots of motivation[4] to eLearners who **cannot cope with the demands of numerous**			12	
62						**online tasks**[8] and so I give fewer e-tivities[1] for eLearners who are able to collaborate			12	
62						**enthusiastically**[5].			12	
79	eM16	T7	1	5	6	eLearners value eModerator tasks to elucidate/clarify difficult concepts . E-Learners who				1458 DH
79						are **weak in knowledge construction**[8] need lots of eModerator empowerment[4]			12	
79						and a few tasks at a time[1]. They **may apear to be collaborating with enthusiasm**[5] but not			12	
79						focused on the task.			12	
132	eM21	T20	1	2	6	I find weaving and archiving useful in allowing me to show my appreciation of	1458	DH	12	
132						the participants interactivity online. Few ideas are developed, with **little**			12	
132						**knowledge building**[8].They **collaborate keenly**[5], but more for social purposes. I need			12	
132						to empower them continuously[4] with continuous feedback. Giving a few tasks[1]			12	
132						works better, preventing information overload.			12	
143	eM22	T8	1	4	2	For a student-centred, collaborative approach weaving and scaffolding are	1458	DH	12	
143						useful to ensure that ePeers who struggle with e-tivities are given a lot of			12	
143						motivation[4],with less tasks[1]. This helps ePeers who are **keenly collaborating**[5]			12	
143						mainly as 'social banter' , to tackle **knowledge construction which they find difficult**[8].			12	
159	eM24	T11	1	5	3	Weaving can give ePeers a lot of motivational support[4], to help in knowledge	1458	DH	12	
159						construction. The ePeers do better with a few, simple tasks,suggestions and			12	
159						explanations[1]. The students find it **hard to develop new knowledge**[8] and their			12	
159						**enthusiastic collaboration**[5] is limited to numerous trivial non-task oriented			12	
159						exchanges.			12	
177	eM26	T4	1	3	4	Weaving and summarising are useful for developing group-think. Sometimes	1458	DH	12	
177						task-overload[1] defeats the object of learning. The ePeers in my cohort need			12	
177						lots of motivation[4]. **A lot of online collaboration takes place**[5], but with			12	
177						**little evidence of knowledge creation**[8].			12	
185	eM26	T13	6	4	1	Some ePeers **collaborate effectively**[5] for social reasons rather than focus on the	1458	DH	12	
185						discussion topic. They **show weak knowledge construction online**[8] and			12	
185						work much better with few simple tasks[1], and giving them as much motivation as			12	
185						I can[4].			12	
195	eM27	T17	6	5	2	My eLearners **enjoy socialising and collaborate a lot**[5] but **they do not seem to be**	1458	DH	12	

195
195

able **to construct knowledge to an great extent**[8].There lies the difficulty. I keep tasks to a minimum[1], with a lot of motivation[4].

12
12

Statements for Implicit Pole

50	An e-moderator has the opportunity to pace discussion(i.e.time management) using weaving to keep discussion forum on target. Highly motivated eLearners do not need to be motivated [3]nor be given many e-tivities[1] because they create their own problem-solving tasks.	13	A	1	1 1 1
90	There are a number of eLearners who are extremely confident online. I do not need to give any extra encouragement[3] by using socialising skills and only a few e-tivities[2] to develop a sound debate.	13	A	1	1
92	A lot of knowledge creation is demonstrated by enthusiastic ePeers who generate their own problem-solving tasks, in which case I don't provide so many e-tivities[1], nor extra coaxing[3] as they enjoy the freedom to explore new ideas.	13	A	1	1 1
130	It is very helpful for eLearners to look up previous postings in the course archive.Some Some ePeers need only a few e-tivities[1] to get started on a topic and are so keen that I find it unecessary to give them any further encouragement[3] other than positive feedback occasionally.	13	A	1	1 1 1
51	Too much tutor intervention may stifle eLearner collaboration. Some v.motivated[3] eLearners who do not need to be motivated[3] resent eTutor intervention on the grounds that they expect to be given the freedom to explore lots of e-tivities[2], independently in their own way, without interference.	23	B	2	2 2 2
87	I do not need to motivate[3] eLearners who enthusiastically engage in the numerous e-tivities[2] on offer in the discussion forum. They are keen to make progress, and I can archive the material without any problems at the close of a thread.	23	B	2	2 2
96	When ePeers find it easy to focus on a topic, I do not need to give them lots of motivation[3], but many e-tivities[2] do boost their enjoyment of online learning.	23	B	2	2
129	Weaving gives me the opportunity to add value to ePeer contributions especially when they are eager to complete more and more e-tivities[2]. Being v.motivated themselves, I find it unecessary to prompt interest[3].	23	B	2	2 2
156	Summarising encourages eLearners to engage in masses of exercises[2]. Some are v. keen,	23	B	2	

	independent eLearners who consider it patronising if I give too much praise, so I don't need to give much motivation[3].				2 2
179	Archiving helps to remove the many postings to an accesible repository,for my keen eLearners who thrive on lots of e-tivities which I give[2]. As they are already highly motivated, self-directed I do not need to give any additional motivation[3].	23	B	2	2 2
185	Weaving encourages keen independent, self-directed eLearners to focus on the discussion topic. Lots of 'innovative' e-tivities help[2]. There is little necessity to provide additional motivation[3].	23	B	2	2
28	Archiving helps in supporting student ideas[4] by making a permanent record .'Lurkers' are encouraged by lots of emails from me[4] to to lookup the archive for the many e-tivities to engage in[2].	24	C	3	3 3
52	There is a skill in knowing when to close unproductive thread and archive the outcomes. I send numerous emails to help 'lurkers' feel empowered[4] to share their ideas, but more often than not I take careful condiferation to get the balance right in providing a lot of interesting e-tivities[2].	24	C	3	3 3 3
84	Archiving is content/subject centred for recall at a later stage. Novice eLearners find this v.helpful for locating the many e-tivities available[2]. The archived threads also indicate how ePeers interacted online. This is a good opportunity to increasingly motivate[4] 'lurkers' who feel shy about sharing their thoughts, with others, thinking they may make a 'silly' suggestion which is recorded permanently.	24	C	3	3 3 3 3
33	Scaffolding relies on tutor explanations for motivating increased level of eLearner participation. By sending emails to eLearners who tend to 'lurk', I can successfully encourage with lots of motivation [4] online engagement with lots of interesting e-tivities[2]	24	C	3	3 3
36	Scaffolding can be used to discourage 'lurking' by using rhetorical questions to elicit collaborative learning. 'Lurkers' who tend to be nervous of appearing ignorant will respondlots of encouragement from me[4] to start collaborating when I send lots of useful e-tivities[2] by email.	24	C	3	3 3
70	By scaffolding eTutor shares ideas with eLearners to promote stimulating rapportwith each other. eTutor needs to empower eLearners a lot[4] also with personal emails and lots of interesting e-tivities[2]	24	C	3	3
32	Knowledge construction occurs with peer-group interaction with eTutor to collaborate in eLearning environment. Lots of empowerment[4] and a many interesting e-tivities[2] from the eTutor help novices to share their ideas.	24	C	3	3 3

57	Knowledge constructing encourages eLearner participation with eTutor guidance. Many interesting e-tivities[2] can be sent in personal emails to give eLearners a lot of motivation[4]to come online.	24	C	3	3
42	Socialising encourage 'lurking' by an 'introverted' eLearner in a discussion forum of extroverts. Sendingpersonal emails to 'lurkers' with a lot of motivation[4] to develop confidence and many interesting, thought-provoking e-tivities[2] to keep in touch.	24	C	3	3 3
105	Archiving (detailed record of outcomes)[2] is a useful way of showing the responses to the many online activities[2]. This also helps to empower eLearners a lot[4], giving them more confidence to contribute.	24	C	3	3
106	Archiving is v. helpful to eLearners who appear to be 'lurking'. They depend on the archived discussions to make sense of the way in which to respond to e-tivities. Sending personal emails motivates 'lurkers' a lot[4] and keeps them informed about the many online activities available to them[2].	24	C	3	3 3 3
137	When eLearners are less confident to contribute their postings, I find scaffolding gives eLearners a lot of motivation[4] to respond to the many interesting e-tivities[2] that are meant to provoke debate.	24	C	3	3 3
152	I scaffold a lot with many tasks[2,] and a lot of coaxing to keep eLearners motivated[4].	24	C	3	
169	Summarising can be a way to give a lot of motivation[4] to eLearners who need lots of tasks[2] to keep them busy.	24	C	3	3
184	I use weaving sensitively for ePeers who are afraid to come online, giving them a lot of praise and encouragement[4] when they do. I like to stretch their imagination by offering many e-tivities[2] that relate to their own experiences.	24	C	3	3 3
27	I use weaving a lot because it acts as a catalyst to challenge ideas when ePeers need lots of encouragement from me[4] and a few tasks[1] 'til they have gained a grasp of the subject.	14	D	4	4
29	Weaving gives me the opportunity to give ePeers feedback by showing positive critical appraisal of peer group contributions. This is a means of empowering ePeers with a lot of motivation[4]. Sometimes it is best not to provide too many e-tivities[1].	14	D	4 4	4
73	Weaving places emphasis on combined efforts of eLearner debates. The outcomes of these efforts may need a lot of scaffolding and empowerment[4] to boost the lack of ePeer cognitive skills; giving fewer tasks[1] to prevent cognitive overload.	14	D	4	4 4
45	Archiving is restricted to curriculum support by accuracy of recording outcomes. This is	14	D	4	

	useful in keeping ePeers, informed about the postings that take place. The fewer the tasks set[1], and the greater the encouragement, I give[4] the better the e-Peers respond.				4 4
136	Some eLearners cannot cope with too many tasks, so tasks are kept to a minimum[1], and I give as much motivation as I can[4], mainly in personal emails.	14	D	4	4
77	Archiving is a technique where an eModerator is controlling how to 'close' a debate by close monitoring. Some **very collaborative**[5] ePeers are reluctant to end knowledge creation because **they have more ideas to share for deeper levels of understanding a topic**[7].	57	E	5	5 5
39	An eModerator has the ability to write concisely and accurately about eLearner postings when summarising. This can prove to be challenging when there is **a lot of collaboration amongst ePeers**[5] who generate a **high level of knowledge creation**[7].	57	E	5	5 5
55	Summarising is a way of highlighting significant experiences of ePeers **who collaborate effectively**[5] and **develop a high level of knowledge creation**[7].	57	E	5	5
60	Summarising is a means of non-intervention since eLearner points of view are concisely recorded for review. This helps ePeers keep focused who tend to diversify with numerous ideas which **build** lots of new patterns of knowledge7 through very active online collaboration[5].	57	E	5	5 5
59	Scaffolding encourages active eLearner responses to tutor suggestions and explanations. **Very collaborative eLearners**[5] develop skills to build **a lot of new group knowledge**[7].	57	E	5	5
65	Scaffolding is used for eLearner support, encouraging elaboration of ideas. Where there is **keen collaboration**[5] with a **high level of critical thinking and knowledge construction**[7], scaffolding is kept to a minimum.	57	E	5	5 5
67	I use scaffolding to encourages discussion to foster diversification of collaborative thinking. My eLearners enjoy **deep levels of understanding in knowledge creation**[7] and have a **keen sense in in sharing their ideas through active collaboration with one another**[5].	57	E	5	5 5
61	Knowing when a thread has been exhausted by eLearning peers is sometimes a delicate matter, because v.keen, independent, self-directed, **non-collaborative eLearners**[6] expect to exchange **lots of ideas, with deep levels of understanding**[7] before a thread is archived.	67	F	6	6 6
62	Summarising is a significant skill needed to collect all eLearner contributions. This becomes v. time-consuming when eLearners are independent, self-directed with lots of different viewpoints to consider. The numerous postings show **a high level of critical thinking**[7] with **little**	67	F	6	6 6

	collaboration amongst these eLearners[6].			6
41	Knowledge constructing is a means of providing a framework for debate towards key curriculum issues. Some eLearners who are **independent, self-directed prefer not to collaborate**[6], with **outcomes**	67	F	6 6
	which show a high degree of knowledge construction[7].			6
49	Knowledge constructing is an assimilation of learning content. Some eLearners are **uncomfortable**	67	F	6
	when asked to collaborate with others online, prefering to work independently[6]. Outcomes show a			6
	high level of critical thinking and knowledge creation[7].			6
35	Socualising is an activity supporting student ideas;motivational. Independent, self-directed	67	F	6
	eLearners, however **do not collaborate much**[6] because they think it is too time-consuming, however			6
	a **high level of knowledge construction**[7] is demonstrated in the group, individually.			6
48	Socialising manoeuvres the debate to key curriculum issues. With a community of independent	67	F	6
	eLearners eModerator needs to monitor the diversity of contribution. These are charachteristic of			6
	high level knowledge creation[7] by individuals **without collaborative efforts from eLearners**[6].			6
75	Socialising offers ePeer encouragement to make progress in conceptualisation. **Non-collaborative**	67	F	6
	ePeers cannot work together interdependently[6]. They **may develop many problem-solving skills**			6
	independently which achieves deeper levels of understanding in the creation of knowledge			
	online[7].			6
89	I encourage eLearners to socialise because there is little collaboration when **eLearners**	67	F	6
	tend to be non-collaborative[6] because they **can construct a lot of knowledge** independently[7].			6
138	Knowledge construction occurs at an individual level, where there is **little interactivity amongst**	67	F	6
	ePeers[6]. Deep levels of understanding are observed[7], by those taking responsibility for their own			6
	learning.			6
141	There are **students exploring lots of new ideas with complex problem solving**[7]. Strangely they are	67	F	6
	not keen to collaborate with one another[6].			6
144	I find that when eLearners have **difficulty in socialising/collaborating**[6], they can nevertheless	67	F	6
	succeed in high levels of knowledge creation[7] independently.			6
175	When I summarise ePeers recognise that the discussion thread is reaching a close. Enthusiasts begin to clutter the forum with numerous postings just to get their final say. **Knowledge construction**	67	F	6 6
	is well developed with lots of ideas[7], but **frequently with no collaboration**[6].			6

182	**Students tend to 'go-it-alone;reluctant to share**[6] when they are independent, self-directed. **Their knowledge creation is sound and well developed**[7].	67	F	6	6
191	Eager,self-directed eLearners **can develop excellent ideas for knowledge creation**[7], but **have problems to share these ideas through collaboration**[6].	67	F	6	6
194	Scaffolding provides appropriate support for eLearners who **do not collaborate very much**[6], but who prefer to develop their ideas independently with much deep understanding and **v. sound knowledge construction**[7]	67	F	6	6 6
30	Archiving makes its easier for 'lurkers' to identify important ideas/threads.This encourages some **minimal involvemen/participation**[6], where **little knowledge creation**[8] has been. achieved	68	G	7	7 7
66	When archiving there is no interactivity with eLearners because eModerator 'packs' thread away for revisiting. V.Useful for 'lurkers' who are **nervous about coming online to collaborate**[6] with little evidence of their efforts in knowledge creation of their own[8].	68	G	7	7 7
81	Summarising encourages 'lurking' because the 'lurker' has an easy synopsis **without being 'active' online, neither collaborating**[6] **nor creating new ideas online**[8] .	68	G	7	7
74	Summarising is a 'passive' (i.e. no eLearner active involvement)yet necessary eModerator activity for purposeful access to closure. Thos who tend 'lurk' use eModerator summaries to organise their ideas but **do not come online to collaborate**[6] **nor to demonstrate their knowldege creation**[8] online.	68	G	7	7 7
53	Knowledge constructing is curriculum centred for debating key issues. Often ePeers **refrain from online participation**[6] due to information overload and demonstrate **little evidence of knowledge creation**[8].	68	G	7	7 7
63	By socialising an ePeer group develops collaborative reasoning. **Unsuccessful learning outcomes**[8] are a result of **low levels of collaborative** interactivity[6].	68	G	7	7
68	Socialising online is a powerful way to foster ePeer motivation, where ePeers encourage each other to 'hang in'. Those eLearners who tend to 'lurk' find it **difficult to engage in online collaboration**[6] and this results in **little knowledge creation online**[8].	68	G	7	7 7
91	Archiving is a helpful way to remind students how each ePeer contributed to the discussion. This os especially useful forn 'lurkers' who **do not collaborate online**[6],**nor do they attempt to construct**	68	G	7	7

	knowledge online[8] for some reason or another. Emails are a good way to keep their interest.			7
122	Weaving students' ideas together helps students to recognise how to develop skills for knowledge creation. When **students lack skills for collaboration**[6] because of their tendency to 'lurk', their	68	G	7
	degree			7
	of online knowledge construction is poor[8].			7
131	I find when I summarise it encourages participants to recognise how their ideas can be	68	G	7
	interwoven to create new reflections on a topic. **Their collaborative skills are weak showing little**			7
	interdependence and group-think[6]. **Their knowledge construction lacks depth of critical thinking**			7
	online[8].			7
158	Some eLearners **show great reluctance to share ideas, self-seeking**[6]. They demonstrate a **low level**	68	G	7
	of constructive thinking[8].			7
164	Weaving is a means of encouraging **collaboration, especially where it is weak**[6] **and it pulls together**	68	G	7
	the few shared ideas to bring about some knowledge construction, however little[8].			7
183	When I scaffold I do this with great sensitivity when ePeers tend to 'lurk' and ther is v. scant evidence	68	G	7
	of knowledge creation[8] due to **lack of online participation and collaboration**[6]. Sending personal			7
	emails does improve the situation.			7
189	Scaffolding gives eLearners a lot of motivation when they **struggle to develop ideas for**	68	G	7
	knowledge creation[8]. Having **difficulty in collaborating**[6] puts eLearners at a			7
	disadvantage.			7
196	**Knowledge construction is very challenging**[8] for eLearners who are **unwilling to**	68	G	7
	to collaborate and work together online[6].			7
37	Energising learning potential for eLearners, by weaving their ideas carefully, allows me to	58	H	8
	create a learning environment which is conducive to **ePeers who willingly collaborate**[5]			8
	but **find it difficult to develop new ideas**[8].			8
46	Weaving helps me develop a technique for communicating comfortably without visual	58	H	8
	cues,especially when **ePeers are struggling to keep up with e-tivities**[8] while collaborating			8
	a lot[5] with little succes of achieving knowledge construction.			8
71	Summarising is a way of keeping a factual record that values all eLearners. Some eLearners	58	H	8

	collaborate fervently[5] but there is **little knowledge creation**[8] demonstrated.				8
85	During their Summerising activity, eModerators are concerned in exhibiting a positive attitude and	58	H	8	
	enthusiasm to record experiences. Online summaries help eLearners to focus on the key issues				8
	in a thread. In my cohort there are ePeers who **eagerly collaborate**[5] in sharing ideas but are **not**				8
	so good at knowledge construction[8].				8
58	Scaffolding is valued by eLearners, especially those who struggle with information overload.	58	H	8	
	Scaffolding is a way of meeting eLearner expectation of eTutor intervention to guide eLearner insights.				8
	Whilst **eLearners collaborate eagerly**[5], there is **little knowledge creation**[8] due to social banter.				8
38	Online knowledge constructing is an active exchange of ideas between eTutor and eLearners. **Highly**	58	H	8	
	collaborative eLearners[5] **do not always achieve a high degree of knowledge construction**[8] because				8
	they tend to engage in 'social banter'.				8
117	Socialising brings opportunities for eLearners to **develop skills for effective collaboration**[5], but this	58	H	8	
	does not always lead to deep levels of knowledge creation[8].				8
162	Some ePeers thrive on socialising and exchanging ideas but with a **low degree of knowledge**	58	H	8	
	creation[8] and their **enthusiasm for collaborative problem-solving strategies**[5]results in a cohesive				8
	online learning community eager to make progress.				8
34	Archiving manoeuvres the debate to key curriculum issues, helping keep ePeers focused.	1357	AE	9	
	Many keen, interdependent ePeers[3] **collaborate to such a high extent**[5] that their ideas				9
	generate lots of problem-solving skills[7], so there may be little need to deliver more tasks[1].				9
69	Knowledge construction online is the creation of knowledge through peer-group interpretation. **Very**	1357	AE	9	
	collaborative eLearners[5] thrive on the freedom of exchanging ideas, thereby creating **lots of new**				9
	patterns of knowledge[7]. I do not need to give them many e-tivities[1], nor do I need to give them				
	extra				9
	motivation[3] for successful outcomes.				9
78	More highly motivated[3] eLearners create ideas to build on previous learning experiences and who	1357	AE	9	
	develop a **high degree of knowledge construction**[7]. They **collaborate enthusiastically**[5]. Little need to				9
	give lots of e-tivities[1] because the group is **able to generate its own problem-solving initiatives**[7].				9
168	Scaffolding encourages active eLearner responses to tutor suggestions and explanations.	1357	AE	9	
	V.collaborative eLearners[5] develop skills to build **a lot of new group knowledge**[7]. They are able				9

	do work effectively without numerous e-tivities[1] to spark off ideas as they are high			9
	achievers who do not require any additional motivation from me[3].			9
178	Socialising brings ePeers together to collaborate effectively. In the ePeer-group, members take	1357	AE	9
	advantage of the **freedom to share their numerous creative ideas**7. By **collaborating extensively**[5]			9
	ePeers demonstrate their high level of self-motivation which leaves little need for me to give			9
	additional motivation[3] and task-giving is kept low[1]. They generate their own problem-solving ideas.			9
193	A **lot of knowledge construction goes on**[7]as eLearners are **very willing to share**	1357	AE	9
	their ideas[5].I do not need to empower them[3] as they work well interdependently.			9
	Only a few e-tivities are necessary to get them going[1].			9
76	I find that weaving provides an opportunity of valuing eLearner inputs by creating a	2367	BF	10
	tapestry of ideas. **Self-directed, independent**[6] eLearners like lots of e-tivities[2], without extra			10
	motivation from me [3]because they are **v. keen achievers**[7].			10
64	Knowledge constructing is a more formal structured way of learning with specific goals. Online	2367	BF	10
	collaboration may demonstrate a level of sharing ideas[6] but this **does not necessarily impair a high**			10
	degree of understanding and knowledge creation due to strong problem-solving skills[7]. They look			10
	forward to having lots of			10
83	**When eLearner becomes more confident & independent of 'others' they are unlikely to collaborate**[6].	2367	BF	10
	A lot of knowledge construction can be achieved[7]. There is little need to provide much motivation[3],			10
	but they expect to be given a lot of e-tivities[2] .			10
56	Socialising is an online activity which is not restricted to curriculum support. I send personal	2367	BF	10
	emails to eLearners who **hesitate collaborate with others**[6] and congratulate them on their **expertise**			10
	in online knowledge construction[8]. Because they are familiar with the online environment they			10
	enjoy the challenge of many e-tivities[2], without need of providing any additional motivation[3].			10
82	Socialising gives an online group the freedom to pursue ePeer joint efforts to complete tasks together.	2367	BF	10
	However certain very enthusiastic eLearners do not need to be given further motivation[3] and who			10
	thrive in the construction of knowledge[7] at an individual, independent level **without collaboration**[6].			10
	They expect to be given lots of e-tivities[2].			10
99	Archiving is a very useful way of building a resource base for those who develop **knowledge creation**	2367	BF	10

	with lots of critical thinking skills[7], despite **little collaborative efforts online**[6]. Many interesting			10
	e-tivities[2] are tackled at an individual level.. I find that they do well without extra empowerment[3]			10
112	When ePeers are **enthusiastic in generating lots of ideas in knowledge creation**[7] on an individual	2367	BF	10
	basis, **with little tendency to collaborate**[6], they thrive on lots of tasks[2], without the need to be			10
	to be given any additional motivation from me[3]. They show **little signs of online socialisation**[6].			10
118	Some **v.competent eLearners with deep critical thinking**[7] find it hard to socialise online.	2367	BF	10
	They **show reluctance to collaborate**[6], preferring to work independently. I tend to give many			10
	appropriate e-tivities[2], without the necessity of additional encouragement[3].			10
127	Socialising online is a challenge for keen, independent, self-directed eLearners who **do**	2367	BF	10
	not easily share ideas with one another[6]. They are keen to achieve a **high level of knowledge**			10
	construction[7] and can make good progress without further encouragement from me[3]. They			10
	enjoy the many authentic tasks[2] from me which are related to their everyday work.			10
143	Skillful archiving demonstrates how e-tivities are focused on sharing, shaping and elaborating an	2367	BF	10
	understanding of the discussion topic. Motivated, self-directed eLearners engage in numerous			10
	e-tivities[2], **but without much collaborative sharing**[6] of ideas. Independently they do **create v. sound**			10
	understandings of conceptual frameworks[7]. Additional motivation wasn't necessary[3] to foster			10
	interest.			10
147	I know that many eLearners in my cohort are self-motivated so I do not have to give them so much	2367	BF	10
	motivation[3]. They like to be kept busy with lots of tasks[2]. They are **very good at knowledge**			10
	creation generating their own individual ideas[7] but they are **unable to collaborate or share**			10
	their ideas with each other[6].			10
160	It is possible to use weaving to remind ePeers that they are expected to work as a team rather	2367	BF	10
	than independent, individuals **without due regard to collaborating with one another**[6]. Being			10
	extremely self-motivated they enjoy plenty of e-tivities[2] related to their professional experiences			10
	and consequently do not hanker for a great deal of encouragement from me[3]. Their efforts in			10
	knowledge construction are remarkable as are the critical problem-solving skills they employ to			10
	develop **large amounts of knowledge**[7], creatively.			10
167	Others in the cohort are quite different.Self-confident,self-reliant[3]independent; **extremely good at**	2367	BF	10
	problem-solving[7],showing tacit knowledge from previous experiences.Expect lots of challenges[2]			10

	me, but **not keen to share ideas.**[6]			10
190	Summarising brings together eLearner postings. This can be v. time-consumings when enthusiastic	2367	BF	10
	eLearners work independently **without much collaboration**[6], with many messages conveying similar			10
	meanings. I then sift through them to identify the vast collection of ideas contributing to **a great**			10
	deal of knowledge creation[7]. Their enthusiastic engagement in the many e-tivities[2] meant that I			10
	was not expected to provide a lot of motivation[3].			10
195	Archiving helps me to put away the many postings from eager online learners who achieve	2367	BF	10
	a high standard of knowledge construction[7] by **v. little collaboration**[6]. There			10
	is no lack of motivation so I do not have to coax them[3] but I do give them plenty of e-tivities[2].			10
40	I find archiving a way of controlling what becomes a permanent record of interactivity. It	2468	CG	11
	is an indirect way of providing insight to the many e-tivities available[2] for those students			11
	who are **less confident to come online to collaborate**[6], for whatever reasons. I send many emails			11
	to encourage online participation[4] through socialisation in an effort to strengthen the			11
	development of **knowledge creation which does not appear to be happening online**[8]**.**			11
81	Weaving gives me a way of enlivening postings by recombining subject-based ideas.This	2468	CG	11
	greatly motivates[4] **weak eLearners to increase their level of understanding**[8] and who are apt			11
	to 'lurk' with **v.little online collaboration**[6]. Weaving , in such cases, helps to keep e-tivities			11
	at a higher level of delivery[2].			11
86	Weaving is an effective skill of selecting and sorting eLearner contributions in a though-	2468	CG	11
	provoking framework. This greatly enhances [4]eLearner **collaboration when there is a**			11
	tendency to 'lurk'[6] with **no visible knowledge construction online**[8]. Lots of stimulating			11
	e-tivities[2] can make all the difference in eLearner participation.			11
43	A lot of motivation[4] is essential to bring about sharing experiences. This can be achieved by a good	2468	CG	11
	summary of **the few collaborative efforts**[6] in the development of ideas by those who tend to 'lurk'			11
	because they are **less confident to tackle tasks online**[8]. Lots of appropriate e-tivities[1] are needed			11
	are needed to spark interest.			11
80	Scaffolding is achieved by eTutor interaction with specific goal-oriented outcomes in curricula terms.	2468	CG	11
	This encourages 'lurkers' a lot[4] who are **uncertain about coming on line to collaborate**[6]. They find			11
	it embarassing to expose their ideas online for **fear of making a fool of themselves**[8]. They can be			11
	encouraged with many interesting, curriculum focused e-tivities[2] in personal emails.			11

79	Socialisation is a good way of providing ePeer encouragement to make progress in conceptualisation.	2468	CG	11
	Those eLearners who have a tendency to 'lurk' are encouraged a lot[4] by personal emails from an eTutor			11
	and lots of intriguing e-tivities which provoke responses[2]. This is an effective way to bring **non-collaborative novices**[6] to understand and that all contributions are valued and that they are expected			11
				11
	to **start sharing ideas and build new knowledge**[8].			11
95	Some ePeers **do not seem able to construct knowledge to any great extent**[8].They are **fearful of**	2468	CG	11
	coming online[6]. I give lots of encouragement[4] by coaxing them to use the archive to keep in touch.			11
	I tend to keep the momentum with lots of appropriate tasks[2].			11
101	Where there is **little knowledge construction**[8], ePeers need a large amount of motivation[4].	2468	CG	11
	Emails are a very good way of giving lots of interesting e-tivities[2] to spark the imagination.			11
	They are **reluctant to collaborate**[6] for fear of losing face in the online environment.			11
108	I send many personal emails to ePeers who shilly-shally about what to post in reply	2468	CG	11
	to postings made by their ePeers. Archiving is a way to demonstrate how ePeers are **making efforts**			11
	to collaborate with one another, however weak this may be[6]. Giving a great number of stimulating			11
	tasks2 with a great deal of encouragement[4], using personal emails, does initiate participation.			11
128	Archiving lets me deposit original postings to the course repository where they are readily	2468	CG	11
	reached by each member of the online group. For those eLearners who tend to 'lurk' the			11
	archived messages can be used to get ideas about each of the topics when **students are in**			11
	difficulty, especially in knowledge creation[8]. Some eLearners may object to their sponge-like			11
	behaviour, resenting their non-appearance online and **persistent non-collaboration**[6]. I send			11
	many personal emails with lots of encouragement[4] to come online to try the numerous			11
	authentic activities[2] based on their own experiences.			11
132	Socialising helps ePeers to collaborate at a higher level. It's important to stimulate a lot	2468	CG	11
	of interest[4] with numerous real-life problem-solving e-tivities[2],especially when ePeers			11
	tend to lurk with **little evidence of collaboration**[6] **or knowledge construction**[8] **online.**			11
146	Weaving is a creative task for me that selects online discussion themes and rearranging them to	2468	CG	11
	enhance the online knowledge construction. Some students depend on this because it acts as a			11
	stimulus to bring 'lurkers' online when **only a few of their contributions have appeared**[8] and they			11

	failed to collaborate with others online[6]. Emails are a good way of providing lots of simple tasks[2] with lots of encouraging remarks[4].			11 11
159	I notice the more inputs (knowledge construction)[2] I provide, **ePeers will begin to engage in collaboration**[6] and with few signs of original thinking[8]. By greatly encouraging eLearners[4] there is the possibility of developing a learning community.	2468	CG	11 11 11
170	Scaffolding can be used for giving tips to eLearners who **do not collaborate freely**[6] and complain about information overload as a reason for their **inability to develop new ideas for knowledge. creation**[8]. Many structured exercises[2] work well with lots of encouraging feedback[4].	2468	CG	11 11 11
177	I post a lot of e-tivities[2] followed by a lot of scaffolding to encourage eLearners to come online to share their ideas. There is **little indication of online knowledge creation**[8] with **few signs of online interactivity/collaboration**[6].These eLearners need lots of motivation[4] to increase their self-confidence.	2468	CG	11 11 11 11
186	Collecting eLeaner contributions & summarising can be v.motivational[4],especially for **less academically minded eLearners**[8] who **struggle a lot in knowledge creation**[8]. It is more appropriate to offer many simple e-tivities[2] at first to spark the imagination to start a thread.I have to deal v. sensitively with **those who do not come online to collaborate**[6].	2468	CG	11 11 11 11
188	I find summarising encourages eLearners to engage in the many varieties of e-tivities on offer[2]. If **knowledge construction becomes problematic**[8] and ther is **little sign of collaboration**[6] I tend to send personal emails with masses of encouraging comments[4] to coax them gently back online.	2468	CG	11 11 11
44	Skillful weaving of the **few ePeer contributions**[8] empowers ePeers a lot [4] to **achieving interaction among peer group eLearners**[5] without overloading them with many e-tivities[1]	1458	DH	12 12
47	Summarising is a means of supporting student ideas. It provides a lot of motivation[4] to those who show especially **poor knowledge creation**[8] but **who collaborate keenly**[5] without many desired outcomes. It is more appropriate in such instances to give fewer e-tivities[1] to avoid cognitive overload.	1458	DH	12 12 12 12
72	By scaffolding is a way of sharing eTutor expertise with eLearners. This provides much needed encouragement[4] to eLearners who need only a few e-tivities[1] when they **have difficulty in knowledge** **construction**[8] even though they **collaborate enthusiastically**[5], but not task-focused.	1458	DH	12 12 12

80	For some ePeers socialising encourages closure because they tend to resort to social banter which	1458	DH	12
	is not conducive to knowledge construction. I send personal emails to empower to a large extent[4]			12
	ePeers to tackle a few intersting e-tivities at a time[1] to boost their confidence. Their knowledge			12
	construction is weak[8]. The ePeers **collaborate enthusiatically**[5] but without much success.			12
125	Summarising is a good way to focus on student-based learning.It motivate eLearners a lot[4]	1458	DH	12
	who struggle to study[8]. It's best to give less tasks[1] to **students, who tend to socialise online more**[5]			
	but for personal reasons than for study.			12
142	Summarising can be used as a means of correcting any misconceptions. In an online group,ePeers	1458	DH	12
	may exchange ideas **enthusiastically collaborating**[5] but some difficult points may not be properly			12
	construed,with **inadequately accurate knowledge construction**[8]. The ePeers need to be given a few			12
	e-tivities at a time[1] to avoid information overload and reduce stress with much encouragement[4].			12
149	In online learning groups, students **appear to collaborate with great intensity**[5], but for social interest	1458	DH	12
	rather than specifically for the purpose of knowledge construction within the framework of an e-tivity. Regretably, **students' outcomes lack deep levels of understanding**[8] and so much encouraging			12
	feedback is essential[4] with essentially few e-tivities related to student experiences[1].			12
157	There are **eLearners who find great difficulty in building knowledge**[8] creatively from shared ideas.	1458	DH	12
	Much encouragement with lots of positive feedback[4] can entice those who can cope with only a few			12
	e-tivities at a time[1] as they suffer under information overload. They are **seen to collaborate with**			12
	great enthusiasm[5]**, but for the wrong reasons;mainly socially.**			12
187	It is useful to enliven postings by re nbining subject-based ideas in fewer tasks[1] to boost online	1458	DH	12
	learner confidence[4],especially where they (online learners) **struggle to cope with demands of**			12
	problem solving topics[8]**. Often there is a lot of socialising going on**[5]			12

APPENDIX E

MAPD Instructions for Online Learning

Facilitating Online Courses: A Checklist for Action

1. Be responsive. Especially at the beginning of an online course or activity, ensure that every comment is responded to. If no one else replies, either respond by message or by mentioning the author's comment in one of yours.

2. Don't "lecture." An elaborate, logically coherent but long sequence of comments often produces silence. Use short comments that are open ended and invite response.

3. Be clear about expectations of the participants, for the course as a whole and for each module, assignment, or time period within it. Establish a predictable weekly or bi-weekly cycle of activities; e.g., assignments posted on Mondays and due on Saturdays.

4. Be flexible and patient. Guide the conversation but don't dominate it.

5. Don't overload. Contribute no more than one long comment a day, or less if the students are actively contributing. Several short notes are more likely to be read and appreciated than a single long entry.

6. Monitor and prompt for participation. Read the status report offered by the system frequently. Send private messages to those who are falling behind, or who are reading but not writing. If they have not signed in for a week or more and do not reply to these messages, call them on the telephone.

7. For assignments, set up small groups and assign tasks to them. If the class is too large to have a single discussion space without overloading participants, divide it into two or more discussion groups.

8. Be a process facilitator, who makes sure that participants understand and abide by good netiquette by not insulting each other or getting way off the topic of the course.

9. Write weaving comments every week or two, or assign individuals or groups of students to take on this task of summarizing and focusing the discussion.

10. Establish clear norms for participation and procedures for grading online work that give credit for good participation.

11. Assign individuals or small groups to play the role of "teacher" and of moderator for portions of the course.

Adapted from: Harasim et. al, 1995, p. 191-192

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Supporting Collaborative Learning in Asynchronous Learning Networks

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ABSTRACT

Asynchronous Learning Networks (ALNs) use Computer-Mediated Communication (CMC) to support online courses of study, in which anytime, anywhere access to interactions among the students and the teacher/facilitator is a key element. The asynchronous nature of the interaction leads to new paradigms for teaching and learning, with both unique problems of coordination and unique opportunities to support active, collaborative (group or team-based) learning. Collaborative learning appears to be crucial to the effectiveness of online learning environments. To some extent, special software structures embedded within a CMC can encourage and sustain collaborative learning. However, the most important elements for an ALN learning environment to support collaborative learning relate to the "social construction" of an interaction environment, consisting of appropriate expectations and norms of interaction. In particular, the instructor/mentor must re-conceptualize his or her role as a "teacher" and create a set of opportunities and reward structures that encourage students to look upon their interactions with their peers as valuable resources for learning, rather than focusing on memorizing lecture-type material presented by an instructor. Possible barriers to and applications of ALN in less developed countries are discussed.

1. Introduction

An Asynchronous Learning Network (ALN) is a teaching and learning environment located within a Computer-Mediated Communication (CMC) system designed for anytime/anyplace use through computer networks. Over the last decade, a research team at NJIT has been involved in constructing a specific version of an ALN which we called the Virtual Classroom® , and studying its use in a wide variety of courses, including all of the major courses for a B.A. in Information Systems degree. This paper draws on these experiences. It reviews the nature of collaborative learning, and its key role in facilitating desirable educational outcomes. Then it summarizes the way in which software was constructed to support collaborative learning, and the social construction of such a learning space-the "adaptive structuration" of such a system by a teacher and students-and argues that this is the most important determinant of what happens online.

2. What Is Collaborative Learning?

Passive approaches to learning assume that students "learn" by receiving and assimilating knowledge individually, independent from others (Johnson & Johnson, 1979; Bouton & Garth, 1983). In contrast, active approaches present learning as a social process which takes place through communication with others (Mead, 1934). The learner actively constructs knowledge by formulating ideas into words, and these ideas are built upon through reactions and responses of others (Bouton and Garth, 1983; Alavi, 1994). In other words, learning is not only active but also interactive.

In particular, collaborative or group learning refers to instructional methods that encourage students to work together on academic tasks. Collaborative learning is fundamentally different from the traditional "direct-transfer" or "one-way knowledge transmission" model in which the instructor is the only source of knowledge or skills (Harasim, 1990).

In collaborative learning, instruction is learner-centered rather than teacher-centered and knowledge is viewed as a social construct, facilitated by peer interaction, evaluation and cooperation. Therefore, the role of the teacher changes from transferring knowledge to students (the "sage on the stage") to being a facilitator in the students' construction of their own knowledge (the "guide on the side"). Some examples of collaborative learning activities are seminar-style presentations and discussions, debates, group projects, simulation and role-playing exercises, and collaborative composition of essays, exam questions, stories or research plans (Hiltz and Turoff, 1993). This new conception of learning shifts away the focus from the teacher-student interaction to the role of peer relationships in educational success (Johnson, 1981).

Cooperation and teamwork supports learning evaluation and feedback, resulting in clarification and change in mental models . Secondly, exposure to alternative points of view can challenge understanding and motivate learning (Glasser and Bassok, 1989). Third, a group structure provides social support and encouragement for individual efforts.

3. The Importance of Collaborative Learning in an ALN Environment

There is no question that ALN's have disadvantages as well as advantages in comparison with traditional classrooms. The major advantage is convenience ("anytime/anywhere"), which in turn facilitates students being able to have more total interaction each week with the teacher and with peers, and being able to learn at the pace and the times best suited to their individual needs. The major shortcomings are (1) limited bandwidth or "media richness" (Daft & Lengel, 1986) and (2) the frustration of waiting an unpredictable amount of time to receive any reaction or feedback. The weaknesses of ALN as a mode of communication decrease the feeling of "social presence" of the teacher and the other group members. In turn, this can severely decrease feelings of motivation and involvement, and thus negatively affect the learning outcomes. However, an emphasis on collaborative learning can emphasize the advantages and overcome some of the disadvantages of asynchronous computer-mediated communication.

Several studies have shown that collaborative learning strategies result in more student involvement with the course (Hiltz, 1994), and more engagement in the learning process (Harasim, 1990). Collaborative learning methods are more effective than traditional methods in promoting student learning and achievement (Johnson, 1981), and enhance student satisfaction with the learning and classroom experience. Most studies have confounded the use of computer-mediated communication as a mode of course delivery, with the use of collaborative learning as a pedagogical technique.